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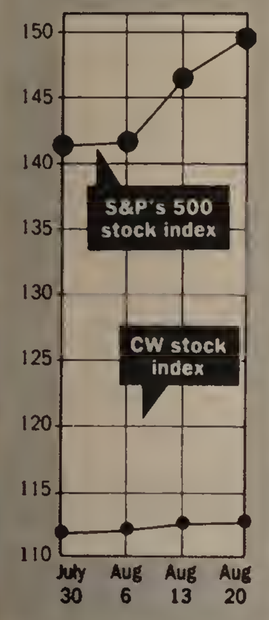
Stock update



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Corvus Systems takes lead in the 80386-system race, shipping a workstation and file servers. **Page 5.**

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Cullinet delivers first losing quarter, but CEO David Chapman sees brighter days ahead. **Page 110.**

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Wide spectrum of opposition builds against proposals aimed at discouraging private-line use by large firms. **Page 8.**

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Ryan-McFarland wins Cobol 85 certification. **Page 4.**

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Tandem user benchmarks VLX processor claims. **Page 39.**

■

Despite predictions that Compaq would introduce a laptop unit featuring a gas plasma display by the end of the year, the largest seller of portable computers officially has no plans to enter the laptop market. Chief Financial Officer John Gribi told securities analysts last week, "You just can't deliver everything you want in a personal computer in a laptop. As the technology evolves, someday there may be a Compaq that works like a laptop, even though it doesn't look like one."

■

AT&T this week is scheduled to unveil the first members of a family of computer and networking products tailored for industrial settings. AT&T has modified its Personal Computer 6300 and PC 6300 Plus with special fans, filters and housings to fit the rugged conditions of the industrial workplace.

■

Originally slated for mid-1987 delivery, the first configuration of IBM's most powerful 3090 mainframe was shipped from the company's Kingston, N.Y., manufacturing facility last week. The first 3090 Model 400 quadratic processor upgrade package will be installed at the Green Bay, Wis., market research firm, A. C. Nielsen Co. Officials at A. C. Nielsen said they hope to complete the process of

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Millennium to back DB2

M&D relational backing includes IDMS/R tools

By Maura McEnaney

RENO, Nev. — Applications vendor McCormack & Dodge Corp. last week joined the growing parade of systems software houses that have endorsed IBM's emerging relational data base standard, DB2.

M&D used its ninth annual users group meeting in Reno to announce the release of Millennium:SDT DB2, a version of its systems development tool designed to support DB2 on IBM 370, 4300 and 3000 series mainframes running MVS.

Before 1,750 attendees, the company also announced the first in a series of products it says will work with Cullinet Software, Inc.'s IDMS/R, a major competi-

See **MILLENNIUM** page 12

Protection axed on Dbase, others

By Douglas Barney

NEW YORK — Ashton-Tate, the last of the three largest microcomputer software firms to address corporate purchasing and support concerns, last week announced a program that left many corporate users critical.

The Ashton-Tate program announced here last week removes copy protection from all company products but does not provide lower prices or limited liability for the illegal copying of software — two chief concerns of Ashton-Tate users.

"The high price of Dbase precludes us from doing anything significant with that

See **PROTECTION** page 6

User buying unaffected by tax reform

By Clinton Wilder and Mitch Betts

The tax reform compromise that the U.S. Congress seems certain to approve in early fall is unlikely to spur more computer purchases by U.S. businesses, according to interviews last week with computer users, vendors and analysts.

The proposed legislation approved by congressional negotiators is expected, however, to reduce taxes for some members of the computer industry, particularly software vendors.

IBM and other vendors have placed part of the blame for the industry slump on customers waiting for the outcome of the tax reform effort before buying. Now that the end of the two-year tax debate is in sight, user corporations said the positive effect of more tax certainty is offset by the loss of the 10% investment tax credit used by large computer buyers.

Resolution won't boost purchases

"The vendors are whistling in the wind if they think that getting the issue resolved will spur new purchases," said Glenn W. White, director of the tax department at Dow Chemical Co. in Midland, Mich. "We have known from the outset that the investment tax credit is dead, so it hasn't played a big part in our recent decisions. Now everything will cost roughly 10% more."

"Tax reform won't cause either a slump or an industry increase," added Dan Cavanagh, senior vice-president of data processing at New York-based Metropolitan Life Insurance Co.

"We've assumed the loss of investment tax credit since September 1985. It won't cause a 'no go' on major projects, although it might impact a marginal one," he said.

See **BILL** page 10

CW SPECIAL REPORT

Beta sites: Pioneer users take risks to grab technical edge

By Alan Alper

In an age when U.S. business is more information dependent than ever, many firms seek a strategic advantage over competitors by volunteering to become beta-test sites for new computer products.

For financial service companies especially, beta testing new hardware and software is inextricably tied to the corporate mission. "At certain companies, there is a policy to be on the leading edge of technology. It's part of the corporate culture," notes Gary Venner, director of research programs at the Diebold Group in New York.

But being a beta-test site is not for the faint of heart, according to several leading MIS managers. The experience can be fraught with problems, especially when firms are testing products that have not been adequately alpha-tested.

In many cases, documentation of beta-test versions of software is technically inadequate, making diagnosis of program failures a trying experience. "Beta testing is not for the unsophisticated," warns Larry Stouder, data center manager for Continental Grain Co. in New York. "It's for the power user who has an experienced staff."

Kavin Moody, director of MIS at Gillette Corp. in Boston, agrees. "You can't go into it without expecting to have to shake down problems," he says. "You usually get good support of the developer or the beta team, but often a feature doesn't work or bugs develop."

Gillette's Moody

Despite the problems, many companies are desperately eager to participate with vendors in a beta test.

When Gillette heard 18 months ago about a powerful office automation and communications software package that Digital Equipment Corp. had under development for its Rainbow microcomputer, the company knew it had to become a beta-test site. "We begged them," Moody recalls. "They

See **BETA** page 15

NEWSPAPER

Home-based workers watch as exploitation debate flares

By Mitch Betts

WASHINGTON, D.C. — An estimated 300 U.S. corporations employ data entry and word processing clerks who work at home, but a national debate has erupted over whether those home-based workers are exploited and whether the practice should be banned by the government.

Unions say businesses can easily exploit home-based workers, turning telecommuting into an electronic sweatshop that should be banned. The U.S. Department of Labor, however, last week proposed to repeal the existing ban on homework in six garment industries, a move that observers said makes it highly unlikely that a ban on home-based computer workers will be added.

"The Labor Department move on garment workers is a tremendous symbolic action for telecommuters in the data processing field and elsewhere," commented Gil E. Gordon, a Monmouth Junction, N.J.-based consultant on corporate telecommuting.

Nevertheless, the department's proposal has renewed the debate over whether businesses exploit home-based workers, and Congress is putting pressure on federal agencies to increase enforcement of existing laws that protect home workers.

Firm statistics are not available, but Gordon estimates there are roughly 300 U.S. corporations with telecommuting programs, and Congress' Office of Technology Assessment estimates there are 3,000 to 5,000 home workers using computers for outside employers or clients.

J. C. Penney Co., for example, since 1981 has run an experimental program with 20 telephone sales associates who work at home with terminals to take incoming catalog orders and transmit them to IBM hosts.

Reduction in office space

Proponents of telecommuting say it boosts productivity, reduces office space requirements and transportation problems and retains valued employees who stay home to care for children. Carl Kirkpatrick, who manages J. C. Penney's telecommuting program from the Milwaukee office, said his firm has very good relations with its home workers because it treats them like office employees.

"There's only one way to go, and that's to treat them like any other associate in our telephone sales centers. They don't pay for any equipment, they are paid the same salary, they have the same benefits and vacations," he said.

Paul Edwards, cofounder of the Association of Electronic Cottagers in South Pasadena, Calif., said exploitation is very rare. He added that the vast majority of home workers like their working conditions and that union attempts to ban telecommuting would "throw the baby out with the bathwater."

In a 1983 resolution, the AFL-CIO called for a ban on computer homework on grounds that employers may deny home workers fringe benefits and minimum wages and pay piece rates rather than salaries. The dispersed nature of homework means that federal and state officials cannot protect workers from unfair labor practices, the union warned.

Dennis Chamot, associate director of the AFL-CIO's professional employees department, said that the ban against homework in the garment industries was instituted 44 years ago because of horrendous sweatshop conditions and that the union is concerned that such conditions could occur in the 1980s as well.

"If we're seeing these problems with the very tiny numbers that are involved in computer homework today, then surely the potential for more serious problems grows year by year," Chamot warned. "With no regulation at all, the marketplace sometimes tends to drift to the lowest level," he said.

A ban on computer home workers would cover only low-level employees, because administrative, managerial and professional employees, such as computer programmers, are not covered by the Fair Labor Standards Act, Chamot noted.

Critics point to the case of Cal-Western Insurance Co. in Sacramento, Calif., reported by Gordon's "Telecommuting Review" newsletter. Eight claims processors who worked at home as "independent contractors" for Cal-Western sued the firm early this year for back benefits and punitive damages.

The workers charged that the firm controlled their work as though they were actual employees but improperly classified them as independent contractors to avoid paying fringe benefits. The firm is contesting the suit and maintains the telecommuters were treated as independent contractors.

Proper classification important

Gordon, the telecommuting consultant, said the Cal-Western suit has opened employers' eyes to the importance of properly classifying home workers. "In my mind, there is no good reason for employers to cut corners on pay and benefits. There are enough built-in financial benefits to telecommuting, when it's done right, that it's approaching greed to cut back benefits when they really shouldn't," he said.

The importance of the distinction between employee status and contractor status was underscored by a recent report on home-based clerical workers by the U.S. House of Representatives' Committee on Government Operations. Independent contractors do not get health, pension, worker's compensation or unemployment insurance benefits, giving employers a financial incentive to misclassify home workers, the report notes.

The committee urged the Labor Department and the Internal Revenue Service to vigorously enforce existing laws to ensure that home workers are properly classified and to agree on standard definitions of employees and contractors to remove loopholes.

To further study the employee/contractor issue, the IRS this fall plans to survey the 1984 employment tax returns of 3,500 employers to measure the extent of misclassification, Gordon said.

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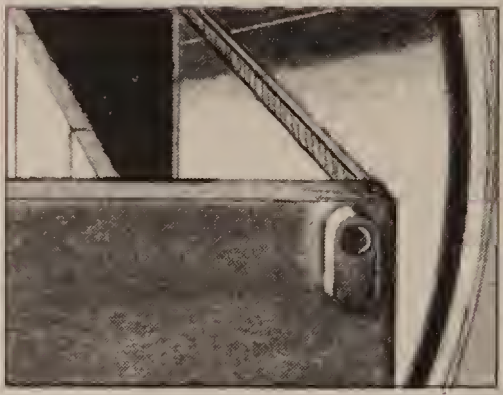

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BY ALAN WITSCHONKE

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Compiler clears agency's Cobol 85 check

Users split on value of GSA certification

By Jeffry Beeler

ROLLING HILLS ESTATES, Calif. — The General Services Administration (GSA) last week certified a Ryan-McFarland Corp. compiler for compliance with the ANSI 1985 standard for Cobol.

In certification tests run Aug. 21 by the GSA at Ryan-McFarland's Los Angeles area headquarters, the company's Cobol 8X reportedly met all requirements for conformance to the Cobol 85 standard's intermediate level.

The test results came a little more than a month after another compiler supplier, Micro Focus, Inc., demonstrated a similar intermediate-level compliance with the Cobol 85 standard.

Within 3% of high-level qualification

Cobol 8X also tested to within about 3% of qualifying for high-level Cobol 85 certification, but that qualification was not the goal of last week's GSA tests, according to Ryan-McFarland's Marketing Vice-President Charles Runge.

The only portion of the Cobol 85 standard that the compiler has yet to conform to are the features that deal with nested source programs, Runge said.

For users, much of the Cobol 85 standard's appeal can be found in its support of structured programming constructs. Users also cite the standard's ability to accommodate large programs as another appealing feature, according to Runge.

But some see other advantages to the standard as well as to the GSA certification.

"The main significance of certification is that it ensures portability of our product," said Kurt Lawrence, the development director at Curtis Information Systems, Inc., an Atlanta-based supplier of turnkey medical systems.

RM/Cobol 85

Features added to latest version from Ryan-McFarland Corp.

FIPS flagging (primary item):
Flags items that are extensions to the language

NOT prefix added to:
ON SIZE ERROR
ON OVERFLOW
AT END OF PAGE
AT END
ON EXCEPTION
On INVALID KEY with READ, DELETE, START, WRITE, REWRITE

SORT with DUPLICATES:
When sorting data that has duplicated data, data will be returned in a specified order

Alphabetic class tests:
Added ALPHABETIC-LOWER and ALPHABETIC-UPPER

User class tests:
User-defined set of character used for class test

Environment Division and Procedure Divisions are optional

Curtis's proprietary software runs on IBM Personal Computers and System/36s.

"What Cobol 8X does for us is to give us a way of keeping our code standard among different operating environments, so we can move readily between boxes as demand changes in the marketplace," Lawrence said. "It's critical for us to be able to do this."

The users' views

Not all users, however, view the Cobol 85 standard as an important consideration.

According to John LaBranche, manager of systems software at Blue Cross/Blue Shield of Florida in Jacksonville, Cobol-8X provides so many benefits over its Ryan-McFarland predecessor, a Cobol 74 compiler, that "whether 8X is certified to the standard or not makes no difference to us."

Compared with the earlier Ryan-McFarland compiler, Cobol 8X reportedly provides up to six times faster sort times. The Cobol 8X is also said to provide 50% faster compilations.

"But from our standpoint, the biggest advantage of 8X is that, when files are converted, data occupies up to 55% less space with the new product than with the old," LaBranche said.

Met most requirements last year

Cobol 8X met most of the requirements of the Cobol 85 standard's intermediate level when the product was announced late last year.

"Our decisions about what features to include in the initial release and what features to leave out were dictated by the input we solicited from a large number of our users," Runge said.

Since then, Ryan-McFarland has reportedly incorporated into Cobol 8X all the intermediate-level features the vendor initially omitted because its users assigned them a low priority.

Bus glitches force DG to drop workstation

By Rosemary Hamilton

WESTBORO, Mass. — Data General Corp. recently canceled plans to market one of the two workstation models it announced late last year, citing development problems primarily with a very high-speed bus.

The DS7700, which had been out at beta sites and missed its April shipment date, was quietly discontinued, and the DS7500 model was repositioned with price cuts, serving as the vendor's primary workstation product.

According to Dave Ellenberger, director of technical products marketing, DS7700 beta users "will be upgraded in a manner worked out between Data General and the customers. Most will likely get DS7500s."

The main snag in the DS7700 development was a new 44M bit/sec. Interprocessor bus. "The problem involved getting it to function properly," he said.

Bus 'was overkill anyway'

Faced with shipment delays, the vendor decided that the bus "was really overkill anyway, and most of our customers didn't require that speed," Ellenberger said.

The DS7500 has a 12.5M bit/sec. bus, which Ellenberger said DG has found to be adequate for its customers.

Meanwhile, the DS7500, which was originally priced at $28,250 for an entry-level monochrome version, now sells for $15,900.

The entry-level color version, which carried an original price tag of $37,050, costs $25,800.

The basic DS7500 comes with 4M bytes of main memory and a 70M-byte disk drive.

The DS7700, which had a planned starting price of $29,000, would have come with 2M bytes of main memory.

Second-class postage paid at Framingham, Mass., and additional mailing offices.

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TOP OF THE NEWS

NEWS from page 1

upgrading their year-old 3090 Model 200 dual processor early next month.

■

Factory-made IBM 3090 Model 400s, rather than Model 200 upgrades, are now scheduled for October shipment. The shipment date already had been advanced twice since the Model 400 was announced in 1985.

■

At least 70 of the 325 attendees at Boston-based Yankee Group's seminar on Digital Equipment Corp. in New York last week were representatives from competing vendors. A list of attendees included 30 people from IBM, five from AT&T, six each from Data General and Honeywell, 15 from Hewlett-Packard and a sprinkling from Wang Laboratories, Prime Computer, Harris and others.

■

National Data Corp. said it is close to reaching an agreement with a buyer of its Rapidata time-sharing division. In May, National Data said it would close down Rapidata if it could not find a buyer.

With the disposition of Rapidata, National Data will leave the time-sharing business and will instead concentrate on credit card services, corporate financial services, health care data services as well as telemarketing. Rapidata had $11 million in revenue in 1986, down from a high of $31 million in 1982.

■

A version of Inset, a $149 memory-resident program that gives word processors graphics capability, will be announced next month by the American Programmers Guild Ltd. of Danbury, Conn.

The program will have full graphics editing capability, variable sizing of graphs and the ability to preview both text and graphics on the same screen, according to Mark Skiba, vice-president of research and development at the firm. Inset is resold by Ashton-Tate for its Multimate word processing software, by Micropro International Corp., Enertronics Research, Inc. and Office Solutions, Inc.

■

IBM last week confirmed it will offer its first C language compiler for the 370. The IBM C Licensed Program Version 1.0 was codeveloped for IBM by Whitesmiths Ltd. of Concord, Mass., and Unisoft, AB, a small software development house in Goteborg, Sweden, during the past year.

IBM C Licensed Program for the 370 provides a C language software environment for host program development under VM/CMS, MVS and MVS/XA. IBM's C language compiler will be compatible with the emerging ANSI standard from the X3J11 Committee, dated April 1985.

IBM C Licensed Program will reportedly provide IMS data base access for MVS/370 and MVS/XA through a DL/I interface, as well as support for CMS data address spaces up to 999M bytes with CMS/Extended Data Array Capability on VM/XA System Facility.

Corvus ships 80386 unit to undefined mart

Price, lack of PC-DOS may slow acceptance

By David Bright

SAN JOSE, Calif. — Corvus Systems, Inc. last week announced that it has begun shipping an IBM Personal Computer AT-compatible system built around Intel Corp. 32-bit 80386 microprocessor.

Corvus' announcement was greeted skeptically by industry observers who said it was overpriced. Corvus also announced 70M-byte and 126M-byte file servers that incorporate the 80386 chip.

Corvus is targeting the systems at software engineering, computer-aided design and manufacturing and networking environments, said George McMurtry, general manager of the distribution division.

However, considering the Series 386's hefty $12,795 price tag and the fact that no IBM PC-DOS operating system is yet capable of taking advantage of the chip's advanced features, analysts expect few users to be seriously interested in buying any of the systems from Corvus.

"Corvus has totally misread the market," said Yankee Group's Michael Goulde, when informed of the workstation's pricing. Goulde said that it would be a "drastic mistake" for Corvus to attempt volume shipments.

"No one is going to buy it," agreed John McCarthy, research manager at Forrester Research, Inc. of Cambridge, Mass. According to McCarthy, Forrester's research indicates that 80386-based systems in general will appeal to only a very small market segment. McCarthy said that only 28% of some 4.8 million IBM Personal Computers installed in the U.S. are AT-class machines and that few AT owners have a need to upgrade to 80386-based systems.

The Corvus file servers, priced at $16,595 for a 70M-byte version and $19,795 for a 126M-byte version, include 60M-byte tape backup drives and Novell, Inc. Netware software.

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American Airlines parent launches information subsidiary

Sabre not included in reservation system

By David A. Ludlum

DALLAS — Joining a trend among sophisticated users of information technology, AMR Corp., parent of American Airlines, has spun off several of its information operations as a profit-driven subsidiary.

The move signals AMR's heightened interest in selling other companies the type of services provided by its highly profitable Sabre airline reservation system, which is credited with giving American Airlines a competitive edge over rival carriers.

However, the recently formed subsidiary, AMR Information Services, Inc. (AMRIS), does not include Sabre, which remains a component of the airline. The subsidiary includes a smaller system for tracking reservations and other information for airlines and three other operations.

AMR has appointed Russell J. Harrison, formerly senior vice-president at Bankamerica Corp., as president of the subsidiary. Max D. Hopper, American Airline's senior vice-president for information systems, is vice-chairman and chief executive of AMRIS.

"My challenge is to develop, or acquire, small companies with good people and good ideas then help them grow into significant profit centers, all without squelching the entrepreneurial spirit that made them interesting in the first place," Harrison said.

Harrison left Bankamerica in May after working on its technology strategy, for a time with Hopper, who went to work for the banking company in 1982 after helping develop Sabre at American in the 1970s.

Hopper left Bankamerica as executive vice-president and the company's top information systems executive last November, citing as reason an offer to return to American Airlines. But reports also linked his departure to the expense and limited success of a major systems development project [CW, Nov. 11].

Before working on technology strategy at Bankamerica, Harrison managed the firm's retail banking systems in California and wholesale systems and other operations in London.

At AMRIS he will oversee four operating units: Airline Automation Systems, which offers information services to airlines; AMR Cable Services, which provides such services to cable television operators; Caribbean Data Services, which does data entry and transmission; and AMR Automation Training, which offers training in automation systems.

Airline system acquisition

AMRIS acquired the airline systems unit through buying Automation, Teleprocessing and Management, Inc. of Austin, Texas, which was in receivership, according to AMR spokesman Joe Stroop. The operation currently has one client, Southwest Airlines of Dallas.

American Airlines' Sabre system provides reservations and other information services to eight other airlines, including one major one, Pan American World Airways. Last year Sabre generated revenue of $300 million and profits of $100 million, according to Stroop.

AMR is keeping Sabre part of American because the services it sells to other airlines share mainframes and data bases with systems that support American. Separating them would be a massive task, according to Stroop.

Last week, AMRIS said it will make more acquisitions. "We like the concept of finding small companies that embody a good idea but are having trouble getting going," Stroop said. AMRIS aims to turn such operations around through AMR's marketing muscle, he said.

In an interview earlier this year, AMR Corp. Chairman Robert Crandall said the company might invest as much as $1 billion in potentially profitable information service ventures [CW, June 9]. One potential venture, according to Crandall and Stroop, is a worldwide airline freight-tracking system.

"Eventually AMR Corp. is going to be as well known for its information services as its airline," Stroop said.

AMR's services subsidiary spin-off follows similar moves by large companies such as Security Pacific Corp., Boeing Co., Grumman Corp. and Weyerhaeuser Co.

Protection axed on Dbase, others

From page 1

product. The price makes you look for alternatives," said Dick LaRue, director of technical development support for the Federal Home Loan Mortgage Corp. (Freddie Mac) in Washington, D.C.

A program announced earlier this month by Lotus Development Corp. offered large corporate users direct sales, removal of copy protection and limited liability but also drew criticism for the lack of lower prices, high volume requirements for direct sales and the removal of copy protection limited to large users.

"In the past year, issues such as copy protection, site licensing, volume purchase agreements, corporate pricing, distribution and the overall need for increased support have become crucial industry concerns," said Ashton-Tate Chairman and Chief Executive Officer Edward J. Esber Jr.

Users welcomed the support programs and the removal of copy protection, but said the firm did not provide answers to demands for site licensing, volume purchases or distribution. Ashton-Tate will not sell large quantities direct to corporations, nor did it provide a method for corporations to save money on large software purchases. Ashton-Tate will, however, sell its service and support programs direct.

One Ashton-Tate official privately claimed that price is not a major issue with large customers, and the firm could not determine a way to reduce the price without losing revenue.

The bulk of Ashton-Tate's program addressed user demands for higher quality support. "The renewed involvement of MIS managers who are cognizant of minicomputer and mainframe software policies and the budgeting for — and control of — personal computers and PC standards in the corporations have created higher expectations [for support]," Esber said.

In addition to free 90-day support, Ashton-Tate will sell a variety of support programs (see related story, this page).

Members of Ashton-Tate's Corporate Advisory Board, a group of the firm's largest customers that had a hand in the development of the program, generally applauded the firm's efforts. "We are willing to spend more to get the best product and service," said Kathleen McKinney, manager of applications and integration for Nynex Service Co. in Boston.

Most users agreed that support is worth paying for, but some questioned the level of support Ashton-Tate will provide. "It is worth paying if there is level of quality and the prices seem reasonable. But it remains to be seen just how responsive they will be," LaRue said.

A highlight of the program was the total removal of copy protection from all Ashton-Tate products, including Dbase III Plus, its best selling data base package. The move was a response to user complaints that copy protection made the use of software more difficult. Lotus had announced the removal of copy protection for its largest customers only.

Despite the wholesale removal of copy protection, Ashton-Tate refused to provide limited liability contracts, under which corporations are only liable for the retail price of software illegally copied by employees. The lack of limited liability irked many Ashton-Tate customers.

"In reality I would find it difficult to believe that they would pursue a minor instance of piracy through the courts when they take the chance of incurring the wrath of a large company," said Les Helgeson, senior training specialist at Beatrice Foods Co. in Chicago. "But rather than leave things like that hanging, they should have a limited liability policy," he said.

Other users were less concerned with limited liability. "If you are a corporation that is concerned with piracy, with policies against it that are enforced, and if in spite of that, copies get made, that can be dealt with without a big-splash lawsuit," said Jeff Knepper, director of advanced technology tax for Touche Ross & Co. in Washington, D.C.

Ashton-Tate argued that limited liability could increase software piracy and vowed to continue its aggressive prosecution of pirates. "If they violate the law, we will — under appropriate circumstances — prosecute them to the fullest extent that we can. To some extent, limiting their liability limits their desire to police, and we want their desire to be high," Esber said.

Users' complaints about the lack of lower product pricing indicate that the issue is still very much alive. "Sooner or later someone will ask, 'What about price?' " said Bill Bremer, project manager of group systems for Metropolitan Life Insurance Co. in New York. However, for many users, including Bremer, price is less important than the product quality and support. "I think all major software is overpriced, but that isn't a real big issue with us," Beatrice's Helgeson said.

Ashton-Tate offers four-tiered plan

- Ashton-Tate announced an immediate end to copy protection on all of its products, including the removal of protection on the 2-week-old Dbase Mac. Users who purchased Ashton-Tate's Dbase III Plus 1.1, LAN Pack 1.1 or Framework II 1.1 prior to July 5 will pay $45 to upgrade to unprotected versions, and users who purchased these products after this date will receive free upgrades.

Ashton-Tate native-language products sold internationally will remain copy protected.

- A four-tier Custom Support Program will be composed of the following:

Basic Support. A free-of-charge, 90-day basic support program available for every product purchased, including unlimited technical telephone support.

Extended I. For $50 per year, users can make up to 10 technical support calls.

Extended II. For $80 per year, users can make up to 20 support calls.

Professional Support. For $150 per year and $100 per year for any additional product, users can make up to 20 support calls that are handled by senior support technicians and are answered more promptly.

- A two-tier Corporate Support and Services Program designed for large corporations with internal support centers will include the following:

Corporate Support Program. For $4,000 per year, corporations are assigned a dedicated corporate service representative and receive toll-free support, a prereview of new products, discounts on publications and courseware and seminars for the corporate trainer. Additional sites can be covered for an added $2,000 per site per year.

Software Care Program. Users have two options. Under the Annual Maintenance Plan, the firm pays one price per product and automatically receives all product upgrades for one year. Quantities of one to 24 cost $275 each, and for more than 100, the cost per package is $200.

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12:30 p.m.	Complimentary Lunch

Seminar dates and locations

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Cleveland, OH October 7
Columbus, OH October 6
Dallas, TX October 15
Detroit, MI October 8
Edmonton, AB November 12
Hanover, NJ October 22
Houston, TX October 16
Los Angeles, CA September 30
Montreal, PQ October 30
New Orleans, LA October 17
New York, NY October 21
Orlando, FL November 6
Ottawa, ON October 29
Pittsburgh, PA October 27
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Rochester, NY October 24
Sacramento, CA October 3
St. Louis, MO October 14
San Diego, CA September 29
San Francisco, CA October 2
San Jose, CA October 1
Seattle, WA November 13
Toronto, ON October 28
Washington, DC November 7
White Plains, NY October 20

Private net users fight Nynex tariff proposals

Protest measures' aim to hamper bypassing

By Elisabeth Horwitt

NEW YORK — Private network users and long-distance carriers have united in opposition against two regulatory proposals by Nynex Corp. that are aimed at discouraging large customers from using private lines, the company admitted.

The proposals represent yet another salvo in the divested Bell operating companies' continuing battle to discourage large users from bypassing the public-switched network, observers say.

Both filed in late June, the proposals prompted a spate of objections from user and carrier organizations, the last of which finished filing earlier this month. One is a petition for a waiver that, if granted by the Federal Communications Commission, would allow Nynex's divested Bell operating companies to charge customers directly for long-distance access costs, instead of passing costs on to the long-distance carriers.

The other proposal is a tariff that would restructure telephone rates so that private-line customers would bear the brunt of long-distance access charges.

Under the proposed tariff structure, private network customers would pay monthly access charges of approximately $4.21 per private line. At the same time, the divested telephone companies would offer savings of 11% to 34% over present rates to users with more than 5,000 minutes of long-distance calling per month, thus encouraging large business users to remain on the public-switched net. "Discouraging customers from bypassing the public network is certainly a principal reason why we've filed the tariff," said Nynex Service Co.'s Joseph Gagen.

The tariff would mean long-term benefits to all users, Gagen claimed, "because if we continue to see large-volume users leave the service, it will be more costly in the long run to the remaining customer base, who will have to share the burden of network operating costs."

A sizable industry segment is contesting the fairness and long-term advantages of Nynex's strategy. Among the organizations that have filed objections to Nynex's proposal are MCI Telecommunications Corp., AT&T, U.S. Sprint Communications Co., the New York State Attorney General's Office, the International Communications Association (ICA) and Telecommunications Association (TCA).

User organizations TCA and ICA objected to Nynex's stated purpose of using special access surcharges to try to force them off private lines. "The divested operating companies want to keep users on WATS and other public-switched services through charges that bear no relation to their use of telco facilities," said R. Michael Senkowski, a partner at TCA's general counsel, Wiley, Rein & Fielding.

If Nynex's tariff structure is adopted in some form by the majority of divested Bell operating companies, it will be "plain bad news" to companies that use multidrop private lines to connect sites across the U.S., noted Jeffrey Held, group manager of Fairfax, Va., consulting company Network Strategies, Inc.

One such firm, On-Line Computer Library Center in Columbus, Ohio, uses private lines to connect 80% of its 10,000 customer terminals in the U.S., noted section manager of network administration Brian Cousins.

"We've been hit every month and a half with rate hikes from a different area. We'd like for the FCC to agree to a set national rate that would apply for a year," Cousins said.

The center received close to a 40% increase from Bell Atlantic Corp. on August 16, a recent 37% increase in Arkansas and a 70% increase that will go into effect on Sept. 4 in Idaho, Cousins reported. "It seems the local telcos feel that they are not making enough money on private lines, so they keep raising rates, and the FCC is letting them," Cousins said. "It's killing our users and us." The center's current monthly bill is approximately $800,000 for private-line use.

The center is evaluating T1 and satellite facilities as a way for some users to bypass local public-switched facilities entirely, Cousins noted.

MCI believes the tariff would "create billing chaos," forcing customers to pay two different carriers for the same call, said company spokesman Robert Jackson.

"Interposing the operating company between the customer and the long-distance carrier is inappropriate and an attempt to redefine access as a direct local telco service when the FCC defines it as part of long-distance service," AT&T spokesman Paul Karoff said. Nynex's proposal is likely to be followed by similar submissions from other divested Bell companies, Held noted.

Bell Atlantic is "still evaluating an alternative tariff structure to Nynex's but basically approves of the plan "to recover traffic- and nontraffic-related costs by directly charging the end user," claimed company spokeswoman Chris Valmannei. "The crux of the matter is that we don't want to price our large customers off the network."

Regional service limits struck down in appeal

Divested companies may buy independents

By Stanley Gibson

WASHINGTON, D.C. — In a ruling that promises to add momentum to telephone industry deregulation, a federal appeals court recently overturned a ruling by U.S. District Judge Harold Greene.

The decision removed geographic limits on where regional holding companies can provide business services.

A panel of three judges unanimously upheld an appeal filed by Bell Atlantic Corp., U.S. West and Pacific Telesis Group of Greene's ruling forbidding them from providing such services as paging and cellular telephone outside their region.

The justices also said that Greene erred in ordering the regional holding companies to stop providing these services.

Some regional holding companies said the ruling also means they will be able to acquire independent telephone companies in each other's areas. "That's our interpretation. . . . It will enable us to acquire independent phone companies," said Bill Hensley, a spokesman for Ameritech.

However, none of the holding companies contacted by *Computerworld* would say what their possible acquisition plans might be. "We have nothing immediate in mind," Hensley commented.

The court, however, rejected a novel argument by U.S. West that Greene's 1982 Consent Decree was not binding on the regional holding companies because they were not parties to it.

In February, Greene had ordered Bell Atlantic to divest itself of its A Beeper Co. subsidiary, a decision Bell Atlantic appealed.

Bell Atlantic had not obtained a waiver from Greene to purchase A Beeper, an Atlanta-based paging company, although other regional holding companies had obtained similar waivers from Greene after requesting them.

"It was like 'mother may I,' " said Brian Farley, spokesman for Bell Atlantic. Greene had granted nearly all the waivers that regional holding companies had requested, he pointed out, but seemed to be insisting that his approval first be requested.

Farley said Bell Atlantic had discussions with the U.S. Department of Justice regarding its intended acquisition of A Beeper and did not apply for a waiver from Greene, believing that it had received the Justice Department's assent.

"It's a crack in the wall for Judge Greene," said Joaquin Gonzales, a telecommunications analyst for the Gartner Group, Inc. of Stamford, Conn.

The appeals decision also means that Southwestern Bell Corp. will not have to receive a waiver from Greene to complete its $1.65 billion acquisition of Metromedia, Inc.'s cellular-telephone and paging operations.

Gonzales said the desision's scope went far beyond the questions surrounding the beeper and paging companies.

"The future of A Beeper Co. is the least important thing about the decision," he said.

Gonzales said the reversal of Greene was part of a larger pattern of events that will lead to eventual freeing of the holding companies from regulation.

A spokesman for Pacific Telesis Group concurred, "We will have better opportunities to move these things through the regulatory process."

Aetna picks Novell LAN over IBM

By Alan Alper

HARTFORD, Conn. — A division of one of IBM's "true Blue" customers last week confirmed it is installing $8 million worth of Novell, Inc. local-area networks (LAN) after passing over systems bids submitted by IBM and other vendors.

Aetna Life & Casualty Co.'s Commercial Insurance Division is installing the LANs, which consist of Novell's Netware S-Net systems running on IBM Personal Computer ATs, at its 52 field offices nationwide. The networks are being implemented to further automate the division's commercial underwriting procedures.

"The new application program runs on PCs and combines new procedures with some previously done on dumb terminals and some that were done manually," noted Wes Zinn, a telecommunications consultant at Aetna. "The LANs will connect over leased lines to an IBM mainframe in Hartford to access permanent policy records, using a minicomputer as a communications controller."

Performance under heavy load

Zinn said Novell was chosen over a number of competitors, including IBM, because of S-Net's ability to perform under a heavy work load. "We compared the Novell network to a number of minicomputer solutions," he said. "In this application, you can have over 100 PCs on the network, and while not all will be used at one time, users will not be running light Lotus 1-2-3 files but will be working with heavy underwriting files.

While Aetna is considered a true-Blue shop, Zinn pointed out that the firm's Commercial Insurance Division is less wedded to IBM than most divisions in the company. The division did not consider using IBM's Token-Ring network because it was not fully implemented at the time product evaluations were done last September, he noted.

He added that the decision to spurn IBM was a tough one. "It was a decision that a lot of people had a hard time swallowing."

Wes Pullen, president of Computer Communications Co. of Weston, Conn., the value-added reseller that initially approached Aetna with S-Net, said that in addition to IBM, Digital Equipment Corp. and AT&T competed with Novell for the contract.

According to Pullen, "IBM proposed using the Series/1 computer as a file server with PC Net, but they didn't push too hard since they were getting a contract for 2,500 souped-up PC ATs worth $10 million."

Both AT&T, which bid its 3B computer and Starlan network, and DEC, which proposed its Microvax II, had problems with their products as well, Pullen claimed.

"AT&T's solution was to use two 3B2s or run the 3B5 — that's expensive," Pullen said.

Working with Novell and Microserve Technologies Corp., a Needham, Mass., distributor, Pullen convinced Aetna that S-Net was the way to go.

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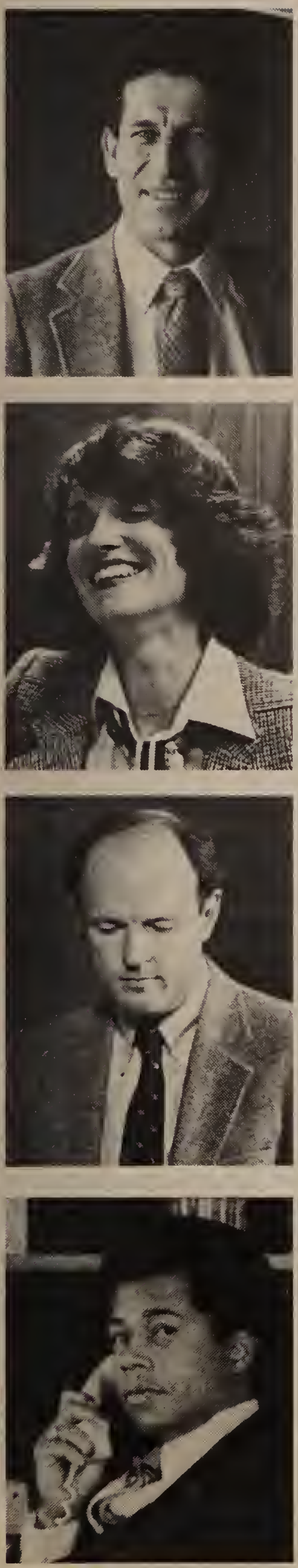

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DCA ties PC LANs to mainframes, extends Irma migration

Targets Netbios, Token-Ring users

By Alan Alper

NEW YORK — Digital Communications Associates, Inc. (DCA), last week unveiled a series of products said to enable IBM Personal Computers and compatibles in Token-Ring or Netbios-compatible local-area networks (LAN) to communicate with mainframes.

The LAN-to-mainframe link products, called Irmalan, provide 3270 terminal emulation and mainframe file exchange capabilities for IBM PCs on a LAN, without the need to equip each PC with the company's micro-to-mainframe connection Irma board, said Richard Darby, DCA's LAN product manager. Instead, software on each PC enables users to access IBM mainframes via a gateway: either an IBM PC emulating a 3274 controller or an IBM PC connected to a 3274.

Irmalan is aimed at resolving the dilemma users face in choosing between LAN or micro-to-mainframe connections, said John C. Bacon, DCA's marketing vice-president of the Irmalan products. "Users now can have both," he declared.

Migration path

Analysts last week viewed the Irmalan introduction as part of DCA's continuing strategy of offering Irma board users a migration path from stand-alone micro-to-mainframe communications to LAN-to-mainframe communications.

"What they're doing is in recognition of a trend toward LANs, which, although they are in their infancy, are growing in importance," said Mark Dunkle, an analyst at Robinson-Humphrey Co. in Atlanta.

DCA unveiled two gateway products that transform a PC in a network into a communications server linking the LAN to the mainframe.

SDLC Gateway is a hardware and software product that allows a PC to emulate IBM 3274 and 3276 controllers. The gateway handles up to 32 mainframe sessions for PCs on the network. Sessions can be pooled for access on a contention basis or dedicated to particular users.

Priced at $1,195, SDLC Gateway will be available in late September.

DFT Gateway, also a hardware and software product, links a PC on the network to an IBM 3274 controller operating in a distributed function terminal mode over coaxial cable up to 5,000 feet in length.

One PC can support up to four DFT Gateway cards, each handling up to five concurrent host sessions, DCA said. These sessions can be pooled for access on a contention basis or dedicated to particular users. Available in October, the gateway lists for $1,195.

Software packages

DCA introduced two software packages that provide Irma functionality to PCs and compatibles by communicating with a gateway product over the network.

SNA Workstation enables PCs on a LAN to emulate IBM 3278 and 3279 models without additional hardware. Using the software, PCs can also emulate an IBM 3287 printer.

SNA Workstation also supports file server software that conforms to Netbios, enabling users to download mainframe files to a server disk, where it can be shared by users throughout the network, Darby said. Available in late September, the package will list for $495.

The APA Graphics Workstation combines SNA Workstation functionality with all-points-addressable mainframe graphics capability. It enables a PC to display host applications written for the the 3179 Model G, 3270-PC Model G and the 3270-PC Model GX that use Graphical Data Display Manager 4.0. It will be available in late September for $995, DCA said.

Bill seen no spur to buying

From page 1

Overall, the historic rewrite of the nation's tax code would raise the tax burden on U.S. businesses by an estimated $121 billion during the next five years. For capital-intensive manufacturing firms that will be hit the hardest, the reform bill essentially crystallizes the trade-off between cutting expenditures and investing in computer technology for a future competitive edge or a gain in productivity.

"Is the tax bill going to take money out of business's hide? Yes. Does it mean they'll buy fewer computers? No," said Ted A. Heydinger, vice-president of the Computer and Business Equipment Manufacturers Association (CBEMA).

"I can make the argument that they better buy the best machines they can to conduct business more efficiently," he added.

Some user companies would agree. "We can't just cut back or decide not to buy or lease any equipment for the future," said the MIS director of an Atlanta-based service company. "The cost of our operations is going to go up, which will cut into the company's profits, and there's nothing we can do about it."

But others, particularly in smokestack manufacturing industries, predicted a chilling effect on information systems purchasing. "When the pool of capital gets smaller, you buy less," said Dow Chemical's White. "Basically, computer purchases are going to be down."

Leasing, rather than buying, computers does not present a better alternative because leasing firms are already raising their rates to compensate for their own loss of investment tax credit benefits. "The lease/purchase decision comes out as a wash," said Metropolitan Life's Cavanagh.

In addition to its effect on MIS capital spending decisions, tax reform will necessitate changes and modifications in industry-specific software applications. "We are going to have to modify a good deal of our banking applications to be able to accommodate all the tax reform changes, which can be costly in itself," according to Fred Cisewski, vice-president of MIS at Bank South in Atlanta.

In the retail business, major rule changes on the capitalization of inventories may require users to buy new applications and hardware, according to Jim Godbout, a partner in the national tax office of Big Eight accounting firm Ernst & Whinney. "People will have to buy bigger and newer computers just to figure out how the tax bill works," he joked.

On the other side of the vendors' balance sheets, however, a potentially lower tax burden could improve computer industry profits. While the real estate, banking, insurance, utilities and steel industries lost significant tax benefits, the computer industry fared relatively well under tax reform.

"We were disappointed that we did not get the R&D credit permanently extended at the current level, but we were able to hold our own on other provisons and thus we remain supportive of tax reform," CBEMA's Heydinger said.

Tax conferees extended the research and development tax credit for three years at a rate of 20%, instead of the 25% rate that applied from 1981 through 1985 when the credit expired. They also kept computer equipment in the three-year depreciation category.

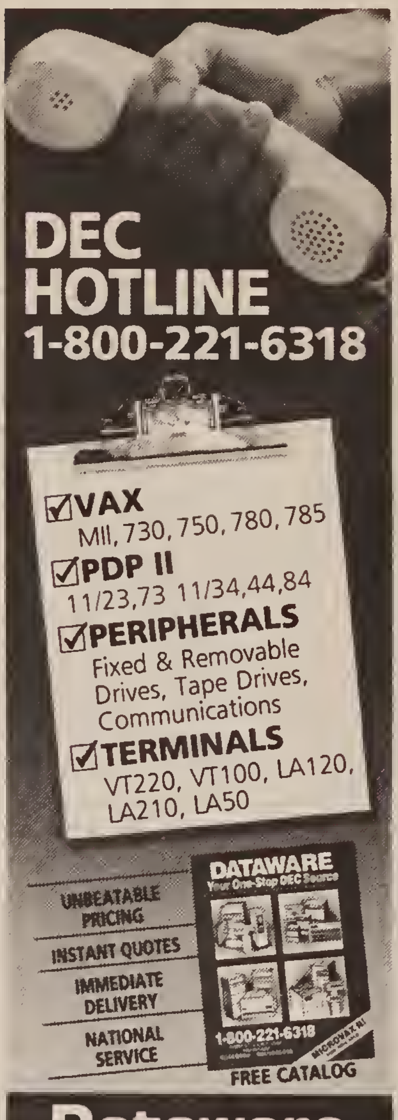
A major feature of the tax reform package is reduction of the top corporate tax rate from 46% to 34%, a very beneficial change for the software industry, analysts said. Hardware vendors have an average effective tax rate of about 30% and thus will see little or no change. But software firms typically have a high effective tax rate of 42% to 44%, which will drop to 34%, according to Coopers & Lybrand.

IBM, a tax reform supporter, believes the bill will be "mildly favorable" to its own tax ledger, a spokeswoman said. If the long-term forecasts are correct in predicting that the tax reform bill will improve U.S. economic growth, "the effects will be positive on us as well as the industry, but only time will tell," the spokeswoman said.

ADAPSO, the leading software and computer services trade group, was ecstatic that tax conferees excluded software firms from the personal holding company tax and that they made software eligible for the new version of the R&D tax credit. "We got two-thirds of a loaf," said Mary Jane Saunders, ADAPSO's assistant general counsel.

Saunders said ADAPSO was disappointed that the R&D tax credit was reduced and that accounting firms — which compete with ADAPSO's computer services companies — will be able to use a more favorable accounting method for computing taxable income.

Correspondent James A. Martin contributed to this report.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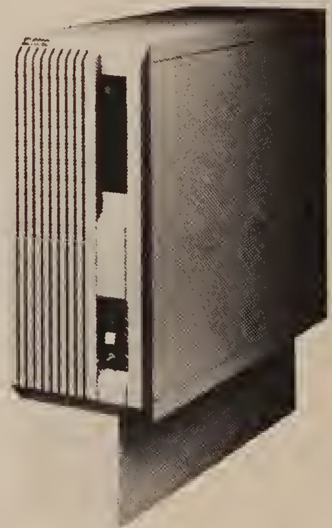

High Performance Relational Database Systems

NEWS

Siggraph focus shifts from technology to marketing

By Rosemary Hamilton

DALLAS — Siggraph last week lived up to its reputation as the premier technology show in the graphics industry. But after 13 years, the Association of Computing Machinery's annual conference was also showing signs that, like other trade shows, it is increasingly becoming a marketing vehicle for vendors.

There were few products at the show for the traditional large and mid-range systems. The three major computer-aided design and manufacturing companies — IBM, Intergraph Corp. and Computervision Corp. — did not have booths at the show.

Although the show floor held few surprises, the overall Siggraph package, with the tutorials and technical papers bundled in, impressed many of the estimated 25,000 attendees.

"I want to keep up with the state of the art, and this is where the present research work and latest industry growth is," said Ron Lusen of the applications software engineering staff at the Plasma Physics Laboratory of Princeton University.

Included in the personal computer-related announcements last week was a three-dimensional graphics display system from veteran graphics vendor Megatek Corp. The $24,900 911 Graphics Engine can use either an IBM Personal Computer AT or an RT Personal Computer as a host, according to the vendor.

Adage, Inc. introduced two plug-in graphics boards for the PC AT and compatibles. The PG Model 10, a $2,895 board that uses one PC AT slot, offers 1,280- by 1,024-pixel resolution in either a four-plane (16 colors) or eight-plane (256 colors) configuration. The PG Model 20, a two-board set that costs $4,895, offers the Model 10 board with a processor board based on the Intel Corp. 80286 microprocessor.

Ramtek Corp. introduced its Ramtek Owl, a $5,595 color display unit for the IBM PC AT that requires one expansion slot.

In the workstation arena, Symbolics, Inc. rolled out its Scope System, which is based on the Pixar Image Computer, a system that reportedly processes 40 million instructions per second from Pixar.

The $299,900 Scope System, which will be available in October, was developed by Symbolics' West Coast Graphics Division and will be marketed to government agencies but can also be used in number-crunching graphics applications such as animation.

Millennium to support DB2

From page 1

tor to DB2.

The systems development tool, which previously allowed users to develop on-line applications under its Millennium architecture, now lets CICS users enter IBM's SQL commands from Millennium screens and create ad hoc queries.

The DB2 capability gives users the option of performing transaction processing or analytical work, eliminating the need to log off a CICS session to perform a time-sharing option function, the company said.

The announcement serves as yet another endorsement for IBM's emerging relational data base. Earlier, Applied Data Research, Inc. of Princeton, N.J., Cincom Systems, Inc. of Cincinnati, Sterling Software, Inc. of Rancho Cordova, Calif., and others stated they were providing support for certain products to operate in conjunction with DB2.

"DB2 has suffered from a lack of tools and a lack of third-party applications," said M&D Corporate Vice-President John Birch. "We are not going to wait for the market to happen; we are going to make it happen."

Beta release of Millennium:SDT DB2 is slated for the first quarter of next year. The product is priced at $108,000.

While several meeting attendees said their companies were evaluating DB2, others said they have no plans to move to a relational system, and M&D's release would not change those plans.

Northrop Corp.'s aircraft division in Hawthorne, Calif., dropped the idea of implementing IBM's IMS data base management system not long ago.

The Northrop division currently uses M&D's General Ledger system and is considering its Human Resources and Accounts Receivable packages, project administrator Mel Gettleman said. "We are going to stay with CICS and VSAM because a large number of M&D personnel are CICS/VSAM experienced," he said.

Extensive use of IBM's IMS/DC DBMS for a data entry system in its European operations is preventing LSI Logic Corp. from turning to DB2, MIS manager Steven Chazan said. While his company plans to stay with current versions of M&D's Purchase Order system, "going to DB2 is the right move for M&D," Chazan said.

In addition to support for the IBM relational system, M&D announced a Millennium version of its general-ledger package for Cullinet's IDMS/R DBMS for the IBM 370, 4300 and 3000 series mainframes.

Other M&D packages for IDMS/R, including Interactive PC Link and Millennium SDT, are expected over the next several months, the company said.

Available in October, GL:Millennium IDMS/R lets users run batch programs against on-line data bases. It is priced at $178,000.

Data base consultant Shaku Atre remarked that M&D's entry into the data base arena is a little late. "Getting into the DBMS market today is not as easy as it was four or five years ago," she said. Nevertheless, M&D stands to benefit from a large base of IMS users waiting to move into DB2. Although IDMS/R sales have dropped off, there are still more than 2,000 users who could take advantage of the M&D applications, she said.

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Micro data base package merges SQL with QBE

By Douglas Barney

SAN FRANCISCO — Wordtech Systems, Inc. this week will announce DBSQL, a $349 microcomputer data base package that incorporates Query By Example (QBE), Structured Query Language (SQL) and embedded SQL and uses the same file structure as Ashton-Tate's Dbase III.

The product will be aimed at the corporate market and will formally be announced at the Data Base Derby, a data base competition to be held in San Francisco, according to Michael Gardner, director of development for Wordtech.

One Wordtech customer contacted was pleased with the firm's current product, Quicksilver, a Dbase III compiler, and expressed interest in the new product. "There may be some good applications for the QBE, perhaps for workers experienced in data base technology," said Richard Hendricks, systems analyst for the Lynn Product Data Center in Lynn, Mass., part of General Electric Co.'s Aircraft Engine Business Group.

For less experienced users, Hendricks develops menu-driven applications written in Dbase. Hendricks was also pleased with Wordtech's support and upgrades. "It is easier for me to get a hold of them than it is to get a hold of Ashton-Tate."

Earlier this year, Wordtech introduced DBXL, a Dbase III-compatible data base. "That is where the Dbase compatibility comes from," Gardner said. According to Wordtech, users can run applications written for Dbase and also use Dbase data disks. The new system has speed and record capacity comparable to Dbase. Although DBSQL is said to handle up to two billion records, the system has only been tested with 20,000 records, Gardner said.

QBE, a key selling point of Paradox, a data base package from Ansa Software Co. of Belmont, Calif., allows users to create queries and update files by filling in the blanks or giving the program an example of what is needed. "QBE requires a minimum of training. It is the easiest interface, and it is unquestionably very powerful," Gardner said.

"That is obviously useful for a layman user, there is no question about it. None of these things, however, turn out to be the best thing since sliced bread," said Sam Lyles, director of R&D for Business Records, Inc., a Dallas computer firm.

SQL is a command-oriented data base language that is being popularized on IBM's DB2 mainframe data base program. With SQL, users trained on DB2 can easily adapt to the micro-based applications.

"On micros we are facing an uphill battle with SQL, but I think SQL is really going to take off. If you are coding applications, SQL is one of the most efficient ways to do it," Gardner noted.

Embedded SQL is a set of extensions to SQL that provide the ability to execute SQL statements from within programs. "We are the first one to embed SQL in a microcomputer data base language," Gardner claimed.

The system requires an IBM Personal Computer or compatible. The firm recommends 640K bytes of random-access memory and a hard disk.

Hyundai PC XT clones debut

Korean giant expands wares, offers micros

By David Bright

BOSTON — By mid-September, $699 IBM Personal Computer XT-compatible microcomputers built by Hyundai Electronics of South Korea should be on the shelves of hundreds of department stores across the country.

Test marketing of the system, which resembles Leading Edge Products, Inc. models, began last week in 16 Boston-area Caldor department stores by Phoenix-based Blue Chip Electronics, Inc.

Blue Chip said it obtained sole distribution rights for the machine from Hyundai Electronics, a division of the Hyundai Group, which is best known for bringing low-priced automobiles into the U.S.

While some mail-order houses offer lower priced systems, the Blue Chip Personal Computer is believed to be the lowest priced system available in retail stores.

Blue Chip originally expected the machine to appeal primarily to the educational market, but in a recent market test in Phoenix, 80% of the systems were bought for business purposes, said Blue Chip President John Rossi.

In both business and nonbusiness markets, there is a "pent-up demand for that price point," Rossi claimed. On the business market side, Rossi expects small and medium-size companies to be the primary targets.

According to Rossi, 35,000 units are on the way to 260 Target department stores in the Midwest and West. Rossi said the Blue Chip machine may also be sold by Best Products Co., a 250-store chain based in Virginia, and the 120 Caldor stores, which are concentrated mainly in the Northeast. To avoid "overdistribution," no more than five or six chains will carry the system, Rossi added.

With its attractive pricing, many potential users expressed interest in buying a Blue Chip Personal Computer for their homes, as well as their businesses.

The basic Blue Chip system comes with 512K bytes of memory, one 360K-byte floppy disk drive, six expansion slots and a 130W power supply for supporting a hard disk drive. A second floppy retails for $129, and a Blue Chip monitor costs $89. Although Blue Chip does not offer a hard disk drive, a half-height, 20M-byte drive can be internally mounted, Rossi said.

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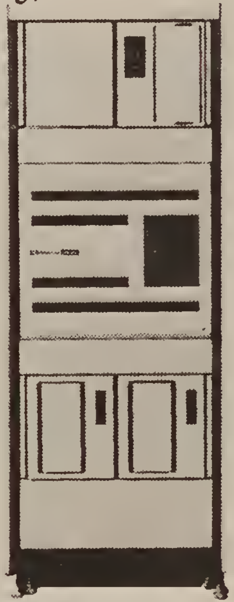

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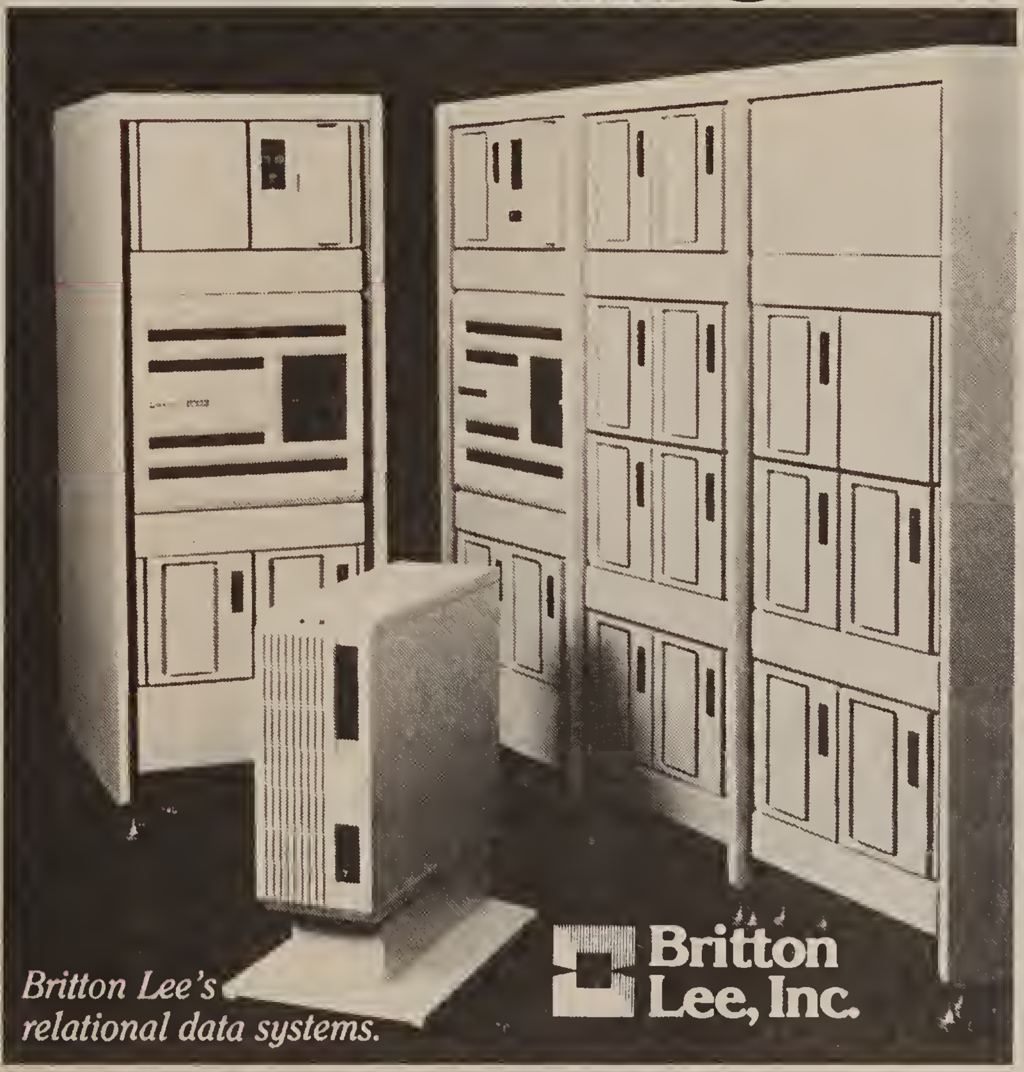

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Borland unveils Turbo Pascal for Macintosh

Sculley welcomes debut; users mixed

By Peggy Watt

SCOTTS VALLEY, Calif. — Another tool for computer professionals who use a Macintosh was announced last week by Borland International, which is scheduled to release its popular Turbo Pascal language product for the Apple Computer, Inc. product this fall.

Borland's unveiling of the new language product, which President Philippe Kahn said is the first in a complete family of Borland products for the Macintosh, was welcomed by Apple Chairman John Sculley, who attended the announcement. This was the third time in two weeks that Sculley has helped launch a third-party product for the Macintosh.

"We had to learn the hard way that a computer is more than a closed piece of hardware," Sculley said. "We had to open it up, we had to get application software on it, and we had to make it possible to do programming. That was one of the successes of the Apple II that we overlooked."

Mixed reaction

Users had mixed reactions to the announcement. Some programmers, less than impressed with Borland's implementation of the Sidekick utility program on the Macintosh, are wary of other Borland products for the Mac, according to Richard J. Hubert, president of the new Apple Programmers' and Developers' Association in Renton, Wash.

"There's an interest in Pascal, but the programming community is not holding its breath for a Borland product," Hubert said.

Macintosh programmers, however, will welcome a Borland Pascal package that lives up to the reputation of the IBM Personal Computer version, according to Mike Bailey, program planning specialist at Lockheed Missiles and Space Co. in Sunnyvale, Calif., who leads several internal Macintosh program development projects.

"There's a lot of people waiting for that Pascal," Bailey said. "They're using Apple's Mac Pascal now and complaining about it." The Macintosh has lacked a good Pascal compiler, he added.

Turbo Pascal for the Mac is Borland's third Macintosh product; Macintosh versions of Sidekick and Reflex were previously released. According to Kahn, Borland will also release a Macintosh version of Turbo Prolog, which is now available for the IBM PC.

Turbo Pascal for the Mac will be priced at $99.95 and will ship Nov. 15 at Comdex/Fall '86, Kahn said.

The program requires 256K bytes of memory and can take advantage of the Macintosh Plus hierarchical file system but can run on a 512K-byte Macintosh. It draws on the familiar Macintosh interface of pull-down menus and multiple editing windows, which allow the user to edit, compile and execute each window separately.

The program flags syntax errors and other debugging procedures. The user can compile to disk or memory or compile and run the program. Kahn claimed that the architecture and more efficient compiler in the Mac version would be implemented in future versions for the IBM PC.

Kahn said Borland does not plan to release a Turbo toolbox for its Macintosh version, as it has for the IBM PC, but that third-party developers may supply those utilities.

World Digest

Japan PC trade levels

TOKYO — Japanese shipments of personal computers during the April 1 to June 30 quarter almost leveled off compared with shipments of a year ago, 425,000 units, according to a Japan Electronics Industry Development Association survey released in Tokyo last week.

The total number of units shipped included 258,000 delivered to the home market, up 7% from a year ago, and 167,000 for overseas markets, down 9%.

PTT naysays IBM

BERN — IBM sales representatives left Bern with empty order books when the Swiss Postal Telephone and Telegraph authorities (PTT) reportedly refused to sign a $43 million contract at the last minute for a computer-based telephone project dubbed Terco.

When the PTT realized that the IBM contract did not guarantee fixed prices, it balked.

The PTT also accused IBM of proposing only the most expensive equipment for the project and gouging it for IBM advisors on the project (IBM systems analysts cost the PTT $210/hour).

The project has subsequently experienced a temporary delay to negotiate cost-cutting measures.

BBN wins federal contract for parallel system

Hopes to build 8,000-processor Butterfly successor

By James Connolly

CAMBRIDGE, Mass. — BBN Advanced Computers, Inc., which last month enhanced its Butterfly parallel processor, has won a federal contract that the company hopes will lead to development of a successor for the Butterfly.

Under the three-year pact announced last week, BBN will develop an 8,000-processor prototype computer for the Defense Advanced Research Projects Agency (DARPA).

The Butterfly, which has been installed in about 60 sites since it was developed in 1981, was also the product of a DARPA research contract.

The Butterfly was designed to support up to 256 parallel processors.

A BBN spokesman said the technology used in the prototype to be developed under the $4.8 million contract could be utilized in a massively parallel system to be offered sometime during the 1990s.

Proprietary BBN technology

He added that key elements of the prototype would use proprietary BBN technology, including custom very large-scale integration components.

"This activity represents some of the most advanced work in the field of parallel processing. These developments will have significant impact for science and engineering, where increasingly complex problems lack sufficient computing power. This computer design, which features shared memory instructions and general-purpose processors, will be capable of billions of floating-point operations per second," maintained Randy Rettberg, vice-president of research and engineering at BBN.

Rettberg also said the prototype will offer several gigabytes of memory, a 1G byte/sec. I/O capacity and a design that eliminates cabling among the switch, memory and processors.

Newly formed subsidiary

BBN Advanced Computers, Inc. was formed last month as a subsidiary of Bolt, Beranek and Newman, Inc. At that time, the company announced the availability of 1G bytes of shared memory, optional Motorola, Inc. 68020 and 68881 processors and an extended Fortran 77 compiler for the Butterfly.

While the Butterfly has the capacity to include 256 processors, the largest systems to date are 128-processor configurations at the University of Rochester in New York and in a DARPA installation.

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Beta testing worth the risk

From page 1

had a system that no one else had that solved our particular need at the time."

Gillette knew that the package, called Rainbow Office Workstation, would enable its salespeople, using DEC Rainbow microcomputers at home, to communicate over phone lines with the VAX minicomputer at Gillette's headquarters. Sales personnel would then be able to take advantage of a number of host-based services, such as accessing data bases, entering orders or sending and receiving electronic mail.

Although beta testing of the package went smoothly, Gillette had some problems with the product after it was installed. "It's working well now, but in some sites where our people live, one batch feature is not supported. It's a problem with some of the local telephone companies that we can't work around."

Computer vendors usually select beta environments that are optimally configured to provide the most accurate performance appraisal of their products. Vendors are biased toward firms with which they have worked before, large customers or prospects or avant-garde applications of their products.

"We view them as privileged," says Richard Moore, director of marketing at VM Software, Inc. in Reston, Va. "They're perceived as people who can handle the latest and the greatest."

Young vendors, however, take more of a shotgun approach, accommodating most firms that offer to become beta-test sites. "Hardware start-ups, for the most part, just want to get their boxes out there," says Kim Schlesinger, a research analyst with the Gartner Group, Inc. in Stamford, Conn. "The only way for them to generate sales at that point is through reference accounts."

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> ***'When a Lotus or a Banyan comes to you and asks what they should change in a product, it's fun and beneficial to both parties.'***
>
> — Larry Stouder
> Continental Grain Co.

Overall, vendors view beta testing as a key sales promotion tool once a product is launched. "If you can say so-and-so is using the product and they're a prestigious company, it's of great marketing assistance," Diebold's Venner concludes.

Users usually seek to become beta-test sites after discovering that a product that fits a particular need or an expected future requirement is under development. The user then requests to test the product.

Vendors generally acquiesce, particularly if the user is a customer in good standing or is considered a hot prospect.

Many end users, searching for solutions to unique problems, find that becoming a beta-test site can often be the right tonic.

A couple of years ago, General Electric Co.'s Automation Controls Division in Charlottesville, Va., wanted its 200 software developers using IBM Personal Computers to have access to its DEC VAX minicomputer. The division searched until it discovered a small New York firm, Coefficient Systems Corp., that had developed a VT100 emulation package for PCs called VTERM.

"We heard about it through a networking group," recalls John Owens, a software analyst with the GE division. "We called [Coefficient] to ask if we could try it out."

After testing VTERM and looking at other packages, the GE division chose Coefficient's software. "Since we had beta-tested their software, we felt we'd be in a better situation," Owens says. "As a matter of fact, they took most of the suggestions we gave them and incorporated them into the next version of the product."

Ends don't justify means

Not all MIS operations are wedded to the beta concept, however. Some companies claim the ends often don't justify the means.

"We don't beta-test micros anymore because it's not worth the trouble," notes a technical guru at a major life insurance company who requested anonymity. "You have to devote your top technical staff, and it takes more time than it's worth."

Others embrace beta testing as a means of resolving unique problems not addressed by products already on the market. "It can help a user get a feature that is not available elsewhere," suggests Sunday Lewis, president of New York consulting firm Techvantage, Inc.

For avid testers of technology, the payback can be enormous.

As product life cycles shrink, beta testing has taken on increased importance as a means of staying abreast of technological innovation. "Given the shorter product life cycles, if you can get a product early in the cycle, you can use it longer," declares Peter Murphy, second vice-president of data processing at the Travelers Cos. in Hartford, Conn. "In accounting terms, you can depreciate it more quickly."

Beta testing can also be used as leverage when it comes to negotiating prices with vendors, says Bernard Weinstein, vice-president of branch information systems, communications and programming at E. F. Hutton & Co. in New York. "If you're one of the first to use a product, you can get more aggressive with pricing because you're helping to create a market."

Active beta testers also say it enables them to attract higher quality employees. "Beta-testing implies leading edge," Traveler's Murphy stresses. "You can get better people right out of university or experienced hires by telling them, 'If you join Traveler's, you'll do new exciting things as opposed to working on technology that's five years old.' "

Firms in depressed industries, such as oil or energy, contend they are no longer able to commit the financial resources or manpower that proper beta testing requires.

"A few years ago, we did a lot of beta testing, but business isn't what it used to be," laments Jerry Kramer, division manager for computer services at Marathon Oil Corp. in Findlay, Ohio. "With the belt tightening that's going on, we found that the excess people capacity is not there anymore."

Kramer emphasizes that even without beta testing he stays apprised of technology that's hot as well as technology that's not. "We get word of who tests what through user groups and such," he says. "We can get a lot of commentary that carries as much weight as beta testing."

Beta testing is less significant, Kramer says, because having the biggest and the first computer is not as big an issue as it once was. "People today are paying more attention to the economies of computing, things like decision support systems," he concludes.

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>
> — Bernard Weinstein
> E. F. Hutton & Co.

Yet, by playing their cards right, firms that allow themselves to become technological guinea pigs have the opportunity to help mold the development of the products to fit their needs. In many cases, vendors concede, user feedback contributes to the last-minute enhancements made before products are officially released. This input usually affects next-generation versions of the product as well.

"We enjoy developing a close relationship with a manufacturer so that we can influence the direction and enhancement of software and hardware," Continental Grain's Stouder admits. "When a Lotus or a Banyan comes to you and asks what they should change or get rid of in a product, it's fun and beneficial to both parties.

"In some cases the initial product may not fit," he continues, "but future products do."

The privately held, $12 billion commodities trading firm says it feels it's better to place products directly into a production environment rather than test products on the side. "It's riskier and you have to be willing to throw the whole thing away if it doesn't work out, but we feel we have the technical staff to get us through any situation that arises."

Most companies look askance at such an approach. "There's a real potential for getting burned," warns Murphy at Traveler's. "When you bring in new hardware or software, there may not be a problem with that particular product by itself, but it could hurt other products in the environment. There's a little bit of a risk involved."

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VIEWPOINT

EDITORIAL

Home work

For more than 40 years, U.S. organized labor has waged war on the concept of home-based work, charging that the practice allows employers to shortchange their off-site workers — in wages, benefits and working conditions. In the latest skirmish, the AFL-CIO is sniping at a U.S. Labor Department proposal that would cancel existing federal bans on home-based work and substitute employer reporting procedures designed to guarantee that home-based workers are paid a legal wage.

Further, the AFL-CIO and some independent unions argue that the bans should not only be retained but expanded to prohibit the growing phenomenon of home-based computer work. This development, with its strong appeal to data entry clerks, word processors, programmers and the like, raises the spectre of an odious electronic sweatshop, and organized labor wants to stop it dead right now.

This position is based more on big-labor rhetoric left over from the '30s than on home work realities of the '80s. Today's telecommuters not only scoff at charges they are exploited, but speak with enthusiasm of the flexibility that home-based work allows them. Their employers speak with equal enthusiasm, because it allows them to retain mature, experienced employees whose personal circumstances would otherwise keep them from accepting positions in a traditional workplace.

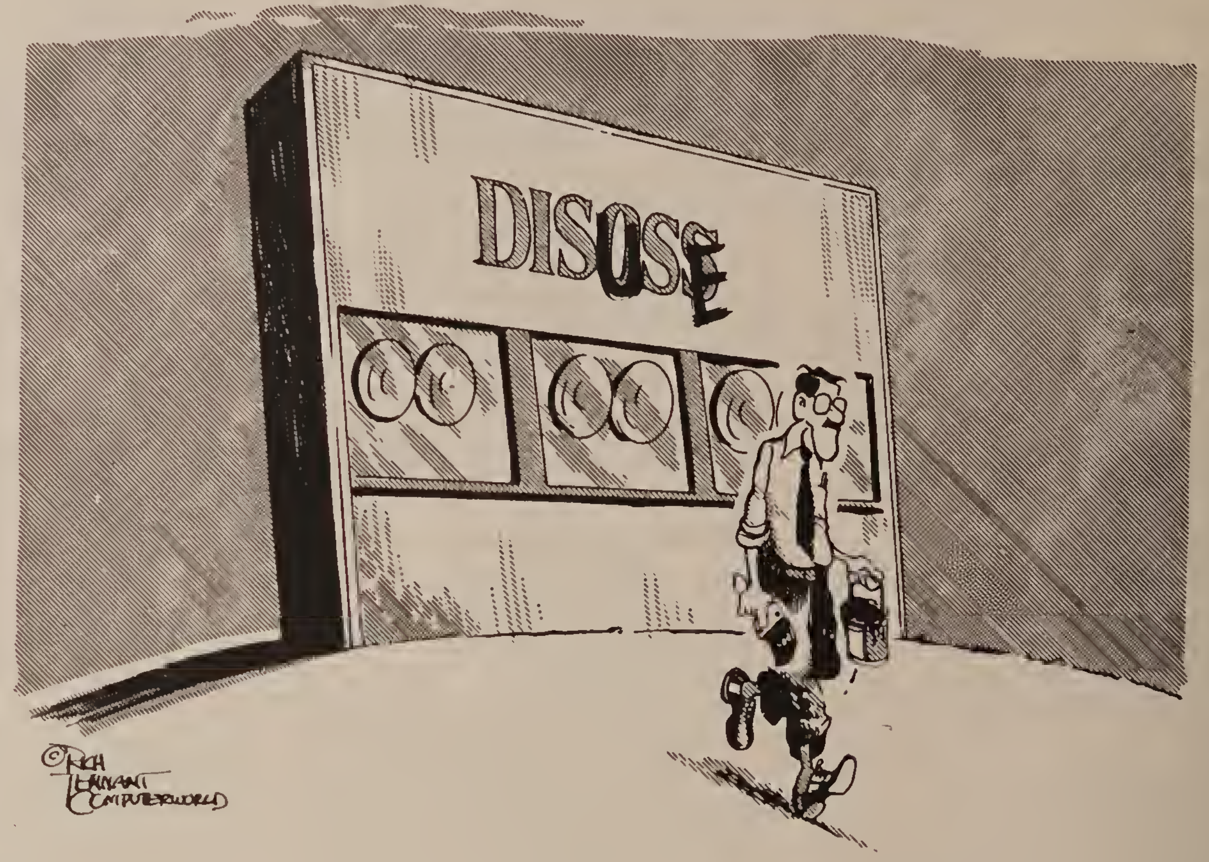
So who is the loser? Organized labor comes to mind. Thanks largely to computer technology, as much as one quarter of the U.S. population may work at home by 1995, according to researchers at MIT's Sloan School of Management. For the AFL-CIO, such predictions paint a clear — and bleak — landscape of a future in which an increasing number of workers will be beyond its reach and control.

This is not to say that home-based workers do not need protection against exploitation. They are, after all, isolated from the peer support structure of the workplace, where human resource abuses are quickly noted (if not always corrected).

Care must be taken, first of all, to assure that home workers are classified correctly as *employees* who are entitled to normal benefits, rather than as independent contractors who are not. As noted in a recent congressional report, the Labor Department and the Internal Revenue Service must work together to agree on standard definitions for the two categories, to close loopholes in classifications and to vigorously enforce existing laws to ensure that home workers are properly classified.

Additionally, the Labor Department must guarantee that home-based workers receive reasonable wages by showing it is serious about enforcing the new regulations it proposes. These regulations would require employers to log and report detailed information on home workers, so that federal inspectors can determine whether minimum pay laws are being observed.

Finally, corporate executives, especially MIS and other managers directly responsible for telecommuting programs, must act with enlightened self-interest in treating home-based workers as they do other employees. This means, at minimum, comparable pay, benefits and work conditions. Such self-regulation will bring all the benefits of telecommuting, including the built-in cost savings for companies and needed flexibility for employees, without onerous government regulation.



LETTERS TO THE EDITOR

Shrink-wrap laws mischaracterized

Jay BloomBecker's In Depth article, "Lobbying for protection" [CW, Aug. 4], mischaracterizes Software License Enforcement Act laws (that is, "shrink-wrap" statutes) as being anticonsumer legislation. Such laws seek to ensure that certain terms contained within license agreements accompanying mass-distributed software will be binding upon persons acquiring such software, even though such persons do not indicate their consent to the agreement by signing it or have an opportunity to negotiate its terms.

BloomBecker criticizes shrink-wrap licenses and legislation validating them because such licenses permit a software vendor to disclaim warranties and limit liability, thereby enabling it "to avoid the responsibility of standing behind its product."

In fact, the validity of such provisions will very likely be unaffected by the presence or absence of a shrink-wrap statute. More important, excluding warranties and limiting liability is expressly permitted under, and governed by, state and federal statutory law and is a practice followed to varying degrees by most commercial vendors. Absent a compelling reason to hold software vendors to a higher duty, fairness suggests that software vendors receive the same rights as other commercial vendors.

BloomBecker also contends that shrink-wrap licenses and laws validating them do not prevent piracy, which he restrictively defines as any violation of U.S. copyright law. This contention is unsupported, and the definition on which it is based is far too narrow.

The value of software lies in the copyrighted code and trade secrets inherent in the software that often require hundreds of thousands of dollars to develop. Such code and trade secrets constitute the logical mold from which the software is manufactured. While it is possible to use software without viewing or understanding the logical mold, it is impossible to distribute the software without distributing the logical mold.

Unless proper steps are taken, the logical mold can be analyzed and used to develop identical or derivative software at a fraction of its initial development cost.

While U.S. copyright law prohibits most copying and distribution of the actual software code, it does not prohibit a user from using the trade secrets inherent in the software.

Vendors of mainframe and minicomputer software have addressed this problem by not *selling* software, but rather only *licensing* users the right to use the functionality the software is designed to provide.

All other uses (that is, disassembly, decompilation, modification and using the software to develop competing software) are prohibited unless expressly agreed to by the vendor. Shrink-wrap licenses constitute an attempt by vendors of microcomputer software to do the same.

Such licenses and laws validating them do not hurt consumers other than individuals desirous of performing an autopsy on the software to facilitate developing a competing package. These people are at best unoriginal and at worst thieves; in either event, they are not worthy of protection.

While such licenses and laws may also prevent well-intentioned people from modifying software for personal use, the difficulty of modifying most off-the-shelf software suggests that the average consumer is not affected by this issue.

Admittedly, many software licenses overreach under the guise of protecting intellectual property rights. For example, prohibitions against preparing backup copies and absolute prohibitions against transferring software are arguably unnecessary to protect proprietary rights.

Fortunately, many vendors realize that their software license is also an important marketing tool that must, therefore, strike a balance between effecting necessary legal protection and granting usage rights consistent with end-user environment realities.

Assuming legislation is necessary to validate licenses accompanying mass-distributed software, consumers should oppose only those laws that fail to establish the above described balance.

Michael P. Brownell
Berman, Roberts & Kelly
Chicago, Illinois

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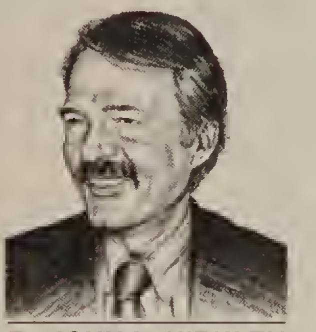
VIEWPOINT

Focus on office realities, not industry myths



By JOHN L. KIRKLEY

It is now apparent that "office automation" is a misnomer.

Many in the industry — the press, the copywriters, the consultants, the marketers — gleefully pounced on the term and tried to make an industry out of it. But like distributed processing, another fuzzy buzzword, OA steadfastly refuses to become a concrete reality (as the American Federation of Information Processing Societies discovered when its office automation conference died of terminal vagueness).

The concept of an automated office is proving to be an anachronism because it implies some sort of rigid technological system imposed from above on hapless office workers. The term denies today's reality. There is a much more complex and fascinating jumble of activity taking place in the office: Instead of office automation, we have integrated office systems, end-user and departmental computing, the push for connectivity . . . in short, a host of new technologies, new systems and new work relationships that are changing the face of the office and the entire information processing function.

MIS's role in the face of all this varies considerably from shop to shop. What is clear, however, is that MIS managers must master three basic skills to handle the rapidly growing demand for integrated office systems.

First, MIS managers must be current on the technology and the industry — no easy task. Recently, knowledge about telecommunications has been added to the list as the Integrated Services Digital Network and other efforts to merge voice and data begin to materialize.

Second, MIS directors must be skilled managers. More is called for here than being an effective supervisor. Because the information systems function is an integral part of the business enterprise, MIS must be thoroughly versed in information resource management techniques. Information is a critical asset and must be managed with the same intensity and creativity that is applied to human and financial resources. This includes dealing with the often unsettling effects of innovation and change. Also, the importance of the information resource has grown. Like it or not, the MIS manager has had to learn to function in the rough-and-tumble arena of corporate politics.

Finally, there is the most ambiguous of the three skills, concerning the squishy world of interpersonal relationships. With the rise of end-user and departmental computing, with interconnectivity becoming a reality, with the blurring of organizational lines and the increasing technological sophistication of top management and users alike, the need to master the deceptively simple skills of active listening, empathy, awareness of one's own strengths and failings — in short, the myriad complexities of human interaction — becomes essential. Too often DP managers have exhibited a preference for machines over people. This subverts the reason for the machines' existence; they are tools, not ends in themselves.

But mastery of the technology, of management techniques and of interpersonal skills is not enough. Critical to the MIS manager's success is how these skills are used. And this, in turn, depends on which of three paths the manager chooses: the reactive, the responsive or the creative.

The reactive MIS manager, sensing the winds of change, uses his skills to fight a relentless rearguard action to maintain the status quo. He hates personal computers; talk of distributed data bases makes him break out in a rash. Control is his goal; fear is his motivator. If he has mastered the three basic skills mentioned above, he can be a formidable adversary.

The responsive MIS manager is different, usually an affable, if somewhat harried, individual who is trying to respond to changes crashing in from the outside. As each new situation arises, he attempts to cope, using the three skills to frantically juggle demands and resources. Somehow his management and users are never satisfied. He wears his beeper to bed.

The creative MIS manager is the change maker, the driver. He and his management are committed to information resource management, long-range planning and involving users and management alike at every critical stage of the information process, from early planning sessions to hands-on applications development and implementation. One of his favorite tools is prototyping, building pilot systems and bouncing the results off his constituency. Quite often he has created an information center and trained a cadre of consultants to assist the users.

He understands that creativity is a complex and sometimes messy business: Organizational boundaries have to be crossed, and people, with all their idiosyncracies and foibles, have to be listened to and understood. All the problems associated with human interaction come into play.

Given the ferment that is just now beginning to take place in today's office, neither the responsive nor the reactive response will work for long. Clearly creativity, innovation and flexibility are the order of the day.

Kirkley, a former editor of Datamation *magazine, is an industry consultant currently acting as editorial advisor to Patricia Seybold's Office Systems Group.*

Managing vendors: Be reasonable, flexible and valuable

READER'S PLATFORM

By BERTRAM S. REESE

Data processing managers are becoming more and more dependent on a variety of vendors for their organization's data processing. Often the DP group is becoming more a resource manager than the large-scale software development house of the past.

In managing multiple vendors, the wise DP manager applies several important rules:

Rule 1. Always keep yourself in a position to leverage the vendor. Positive leverage strategies include paying the vendor promptly and giving the product a positive reference. Negative leverage techniques include spreading bad publicity, going to a vendor's upper management, complaining to the customer base, delaying payment, pitting the marketing fellows against the support people or just suing the vendor outright.

Rule 2. The vendor that is already running a system in your facility has control over other vendors that are trying to get into your shop and interface to the on-site vendors' system. If you are looking for a vendor to interface to an existing system, be assured that it will be the new vendor that will have to make all the changes. Why? Because if it does not, it will not get the business.

Rule 3. Offer to provide funding to identify the source of a problem. In a multivendor shop, finger pointing will happen. A vendor who can successfully deflect a problem to another vendor can, at least temporarily, avoid the expense of fixing it. By offering to fund problem resolution, said funds to be reimbursed later by the vendor that created the problem, you encourage a vendor to admit guilt.

Rule 4. Be willing to fund software development that may be unprofitable to vendors. They typically do not like to do development and certainly will not do development that does not have a good return on investment. If the feature is valuable to you, you must be willing to pay for it.

Rule 5. Do not abuse the vendor's organization. That is, do not constantly go over your representative's head. Use mutually agreed upon suspension dates for action items. When the representative fails to perform, then take your request to someone further up in his organization. Constantly going around your representative gets you a reputation as a whiner, and the vendor will ignore you.

Another effective way to get the vendor's attention is to get its representatives' home phone numbers. Armed with these numbers, you no longer need be lonely when you have to get up at 3 a.m. to handle a vendor's problem. This is by far the most effective way to get action, and you will find even spouses will help you out.

Rule 6. Have a good solid contract. Of course, this is not always possible. The vendor negotiates its contract all the time — DP managers only handle it a couple of times in a lifetime. Obviously, regardless of the negotiations, the contract will always be to the vendor's advantage. But one safeguard should be noted. Vendors will negotiate for data-driven contracts; you want an event-driven agreement. Vendors will want so much money down, so much in three months, so much in six months and so on. Your position must be such that when a vendor gives you a product and when it is operational, then you will pay. This helps keep the vendor honest.

Rule 7. Pay your bills. The key is to stay credible in the vendor's mind. Do not be a complainer, and always pay for services performed. Then when you have a problem, your problem will be perceived to be the exception rather than the rule.

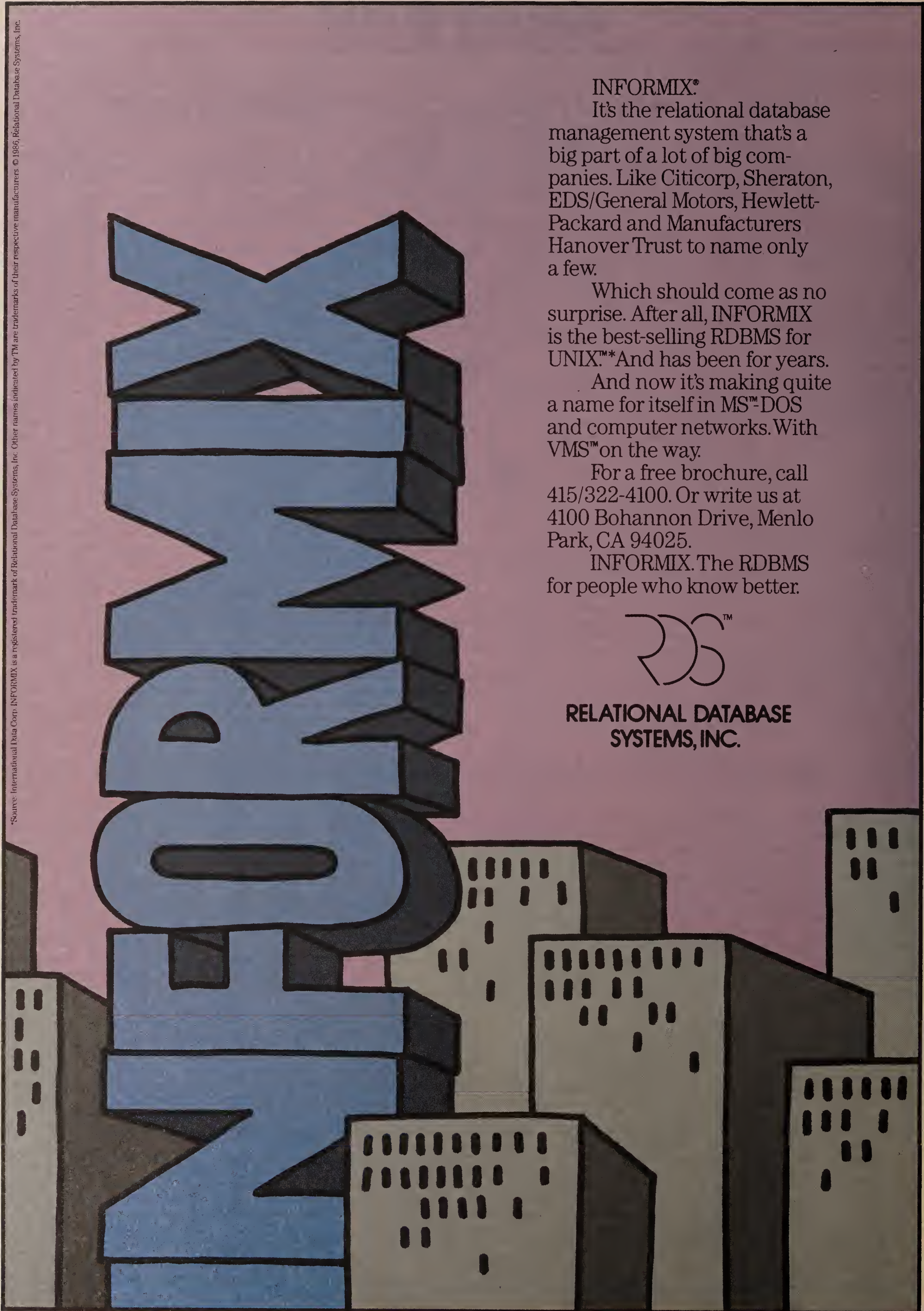
Rule 8. Be active in the vendor's users group. In good users groups, you can find our whether you are crazy or not, that is, whether you are the only one having this particular problem or whether the entire client base is affected. Also, in the users group you can, if you get enough support, leverage the vendor to provide the development or enhancements you require. Users groups also provide a forum for the interchange of ideas such as available features used in a different way or alternative approaches to problem solving.

Rule 9. Have the vendor audit your performance. You have paid a substantial amount of money for a vendor's hardware and software. It is good to bring the vendor in from time to time to evaluate how well you are running it. This is not a free service, but it will give management an idea of just how well DP is doing, this time from the vendor's perspective. It will also give the vendor a feeling for the unique characteristics of your site as it relates to its system.

Rule 10. Always be on the lookout for alternatives to current systems. It keeps you abreast of what is going on in a highly volatile environment, and it keeps the current vendor interested in continuing to provide you with high-quality service.

The key to successful vendor management is to be reasonable and flexible in your approach. Also, evaluate your position from the vendor perspective and provide your vendor with something it wants and, at the same time, obtain the needed service for your organization.

Reese is corporate director of MIS at Alliance Health System, Norfolk, Va.



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Walter Ulrich

Selling execs on innovation

A senior executive at a major company recently told me, "I do not see major expenditures in communications paying off. Companies here in New York have paid a small fortune for advanced telephone systems and intelligent workstations. Head count has not decreased in those companies, and the return on investment fails to meet even minimum requirements. We still have our old telephone system, and I can place a telephone call more easily than my counterpart down the street."

Many nontechnical executives retain doubts about the potential benefits of telecommunications technology. What makes them so hard to convince?

First, communications technology makes many of them uncomfortable because they do not understand it. Trained to deal with sales, marketing, finance or operations, they regard communications as a complicating factor — or worse, an unknown factor.

Second, many communications projects are technical successes but business failures. Time, effort and money are spent without advancing business goals and objectives. Executives get turned on about projects that solve problems, attack market share and improve profitability. They are turned off by making a change that only maintains current levels and services.

Third, when a communications system does fail, it has an immediate impact. Everyone in the organization ex-

See **SELLING** page 21

Ulrich is president of Houston-based management and technology consulting firm Walter Ulrich Consulting.

DEC supports MCI E-mail

All-In-1 users can send documents over distance

By Elisabeth Horwitt

VAX Mailgate for MCI Mail, which enables users of Digital Equipment Corp.'s All-In-1 to send documents over MCI Communications Corp.'s electronic mail service, has been jointly unveiled by the two companies.

The alliance is "very important to MCI," MCI spokesman John Houser said. "DEC tells us that All-In-1 has an installed base of 12,000 systems. We see this as a very good growth market for MCI Mail." All-In-1 users can use the MCI Mail service to send documents to Telex users and to users of Compuserve, Inc.'s electronic mail services, Infoplex and Easyplex.

"MCI Mail is a good match," said DEC marketing manager for electronic mail Richard Derosier. "For example, salespeople on the All-In-1 system for sales and marketing can use MCI Mail to reach customers and each other."

All-In-1 and MCI Mail use similar commands to send documents, Derosier noted. MCI Mail is the only electronic mail service directly supported by DEC. The computer vendor may unveil gateways to other services "during the interim before X.400 is widely implemented," he added. "Strategically, X.400 is the most important multivendor interconnect system." X.400 is an electronic mail protocol that is currently being finalized as part of the the Open Systems Interconnect from the International Standards Organization.

DEC already has implemented X.400 in its own office automation systems. MCI is "working on X.400" but has announced no implementation schedule, MCI's Houser said. Both DEC and MCI indicated that an X.400-based connection between All-In-1 and MCI Mail would be a logical step once MCI has implemented the protocol.

VAX Mailgate for MCI Mail costs $7,500 and will be available in September.

TRW LAN family gets PC net with broadband links

By Peggy Watt

TORRANCE, Calif. — Recently unveiled additions to the Concept 2000 family of local-area network (LAN) products from TRW, Inc.'s Information Networks Division enable users to link IBM Personal Computers on a variety of Ethernet LANs over either baseband or broadband coaxial cable, according to company spokesmen.

The Information Networks Division designs and implements communications systems that are based on its own line of broadband interfaces, plus a growing selection of other vendors' products resold under the TRW label. The division's recent announcements include the TRW PC Connection family of products, which includes internally developed Ethernet interfaces,

See **TRW** page 21

NP line future bridge to OSI

By Elisabeth Horwitt

BOXBOROUGH, Mass. — Announcing an "access platform" for multivendor networking, Micom-Interlan, Inc. recently extended its Network Processor (NP) line to support the VME bus, the Unix V.3 operating system, the IBM RT Personal Computer and AT&T's Starlan. Currently supporting the Transmission Control Protocol/Internet Protocol (TCP/IP), the NP series will provide a stepping stone to the International Standards Organization's Open Systems Interconnect (OSI) standard, Micom-Interlan claimed.

"By building TCP/IP into all of our intelligent protocol processors, we address customers who want multivendor networking now. But we also plan to implement OSI protocols, so that users won't feel stuck in a dead end," said Micom-In-

See **NP** page 20

INSIDE

Hi-Net Communications provides a videoconferencing solution to cope with disasters/**20**

NEW THIS WEEK

- Fibermux 48-channel multiplexer debuts
- Leemah Datacom offers an access control system for its modems
- For more on these and other new products, see pp. 75-80.

INSTANT ANALYSIS

"A lot of users are finding that the easiest and most cost-effective way to install a new bridge or cable is via sneakernet: You sneak it into the office after hours, when MIS isn't around."

— **Ronald Coleman, partner, management consulting services, Coopers & Lybrand**

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COMMUNICATIONS

Hi-Net volunteers to serve in time of disaster

By Elisabeth Horwitt

MEMPHIS — Businesses that need to reach employees or customers during a disaster are being offered complementary transmission time on Hi-Net Communications' satellite-based videoconferencing network, the company announced recently.

"We see it as a marketing move and as a public service for companies that have been hit with a natural disaster or product tampering," explained vice-president of sales and marketing Jim Hines.

Hi-Net, a co-venture with Communications Satellite Corp., currently does audiovisual broadcasting to 900 hotel locations around the country. Companies can use these hotel videoconferencing facilities to communicate vital information to employees, customers and the press during a disaster.

"During the first Tylenol scare in 1984, Johnson & Johnson used videoconferencing to communicate its position. I saw that broadcast, and I saw what happened during this year's Tylenol crisis when the company chose to slug it out directly with the media," Hines said. "Without videoconferencing, the message gets edited; you don't have as much control. They weren't as effective this time around."

"Video technology can play an important role in recovering from a catastrophe," agreed Walter E. Ulrich, president of Houston-based Walter Ulrich Consulting. "When you have a catastrophe, you don't have time to write memos, play telephone tag and fly back and forth to resolve issues."

Hi-Net will not charge business disaster victims for the airtime, which costs between $3,000 to $5,000 for a typical event of this kind, according to Hines. Companies still must pay the cost of delivering the transmission to the site — approximately $200 per site.

Companies can also choose to have Hi-Net set up videoconferencing facilities at their local plants. It costs approximately $1,000 to have a portable satellite dish set up at a company site, Hines said.

NP line future bridge to OSI

From page 19

terlan vice-president of marketing programs Gabe d'Annunzio. Micom-Interlan has contracted with Retix Corp. to implement the Santa Monica, Calif., company's OSI protocols across the entire Network Processor line, he added.

Micom-Interlan's announcement of Starlan support across its NP line came only a few days after the Institute of Electrical and Electronic Engineers, Inc.'s approval of the 802.3 standard that is similar to, but not entirely compatible with, Starlan. Both Starlan and 802.3 define a low-cost, 1M bit/sec. network using carrier-sense multiple access/collision detection protocols.

Micom-Interlan has also unveiled the Nistar, a link-level Starlan controller on an IBM Personal Computer, Personal Computer XT or AT half-card. The basic Nistar product will be available in August for $325, with a $395 version, which includes IBM's Netbios, coming out in November.

"We felt that our multivendor networking products would get much bigger play with Starlan," d'Annunzio said. "IBM's Token-Ring is much more expensive to install." Starlan equivalents of the company's NP100, 200, 300, and 600 Protocol Processors for the Digital Equipment Corp. Qbus and Unibus, the Intel Corp. Multibus, and PC AT systems will be available in September.

Micom-Interlan plans to provide a direct link between its NP300 Multibus Protocol Processor running TCP/IP and systems running Interactive Systems' version of Unix V.3.

Also in conjunction with Interactive Systems, Micom-Interlan will offer the NP624, a protocol processor that provides a direct link between an RT PC running the AIX operating system and either Starlan or thin-wire Ethernet running TCP/IP. The $850 product will ship in December.

Another Micom-Interlan introduction, the NP621 Protocol Processor, links PC ATs running Microsoft Corp.'s Xenix System V to standard Ethernet or Starlan networks supporting TCP/IP. Priced at $1,490, the NP621 will be available for shipment in September. In October, the company plans to ship the NP700 Protocol Processor, connecting VMEbus Motorola, Inc. 68000-based workstations with TCP/IP-Ethernet local-area networks. Priced at $1,890, the NP700 will be available in both thin-wire Ethernet and Starlan versions.

Micom-Interlan's across-the-board support of thin-wire and Starlan versions of Ethernet reflects its strategy of targeting departmental and work group network installations, "for which 802.3 is more than adequate," d'Annunzio claimed.

CORRECTIONS

The article, "Joint development effort spawns optical-fiber PC networks," [CW, June 30] incorrectly depicts the relationship between Codenoll Technology Corp., 3Com Corp. and Sytek, Inc. Codenoll currently has separate and distinct development agreements with 3Com and with Sytek.

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Selling execs on innovation

From page 19

periences it directly as an inconvenience. The loss of credibility due to a major communications failure can set back new communications applications for years.

It is the communications manager's responsibility to win the executive over to technological innovation. Memos and exhortation will not do the job. Skill is needed in three areas: technical, business and sales.

Technical skill ensures that a technology is well received by delivering smooth operating performance consistently to the end user.

This requires an awareness of products and services, technology trends, integration issues, vendor viability, maintenance and support considerations and user requirements. Sound technical management is innovative but also prudent and deliberate. Major communications failures are not tolerated.

Business skill puts communications technology in the context of corporate and broader business environments. Business decisions are rarely made on technical merits alone. A communications manager must learn the language of his company and industry. Recommendations must be couched in simple terms, focused on user needs and motivated by business impact.

Presentations that drone on and on about bandwidth, error rates and traffic patterns are often futile exercises and annoying interruptions for the busy executive. He assumes, rightly, that such technical issues are the responsibility of the communications manager. Executive presentations should show solutions to business problems. Workaday examples of business improvements can breathe life into an otherwise routine report. Achievable hard-dollar savings also attract notice.

Salesmanship is part interpersonal skills and part packaging. Ideas need to be presented and supported in a way that attracts attention and encourages positive consideration. Well-written documents, articulate arguments and personal persuasion all play a role.

Experienced managers work closely with all involved parties to improve their proposals and build support. They make compromises to gain a consensus. Technical competency does not excuse interpersonal incompetency. Technical managers must build people networks as well as communications networks within their companies.

Skeptical executives, such as the one I talked with in New York, can be won over. He became more and more interested when I told him that new communication systems could get him better operating information faster and explained how communications could solve a bottleneck at the warehouse. When I described a scenario where new price lists could be received by the entire sales staff right away, he was more than interested — he was convinced.

People will become excited about new communications technology — and support its implementation — if it is presented in their language and appeals to their interests.

TRW LANs get PC net, links

From page 19

and the TRW PC Server, which is based on network servers manufactured by Banyan Systems, Inc. of Westboro, Mass.

These offerings, TRW's first in the PC LAN arena, are "aimed at the company with 50 to 100 PCs spread over a large area that wants individual departments to have their own server but may want to be able to connect every department into a central service," said TRW General Manager Edward Snyder.

The TRW PC Server consists of a Motorola 68000-based file server and expansion cards that link IBM PCs to the server over either broadband or baseband cable.

The server can interconnect up to four different LANs. Networks currently supported include TRW's own Concept 2000 broadband network, the IBM PC Network and Token-Ring, Pronet from Proteon, Inc. and Net/One from Ungermann-Bass, Inc.

The server runs Banyan's Virtual Network System (Vines), which includes electronic mail, file and peripheral sharing, network diagnostics and administration. The $13,900 server's 43M-byte memory can be expanded to 120M bytes.

IBM PCs equipped with TRW's PC-Elink Ethernet controller card can communicate with the server over standard Ethernet cables. PCs equipped with the firm's PCU-2001 broadband card can interface with a broadband LAN at 2.5M bit/sec. via a link to the server. The PCU-2001 card is $645; the PC-Elink costs $650.

The TRW E-Modems enable IBM PCs equipped with Ethernet boards to communicate at 10M bit/sec. over broadband cable. The TRW E-Modem Repeater connects existing standard or thin-wire Ethernets to TRW's broadband backbone network. The E-Modem is available for $4,350 for a two-port model and $5,350 for an eight-port version. The E-Modem Repeater costs $6,250 for single- or dual-cable networks. Modem products are set for September availiblity.

"TRW is more an integrator than a vendor; acquiring Banyan's line may establish their presence in the marketplace," commented Eric Killorin, publisher of Hanover, N.H., industry newsletter, "PC Netline."

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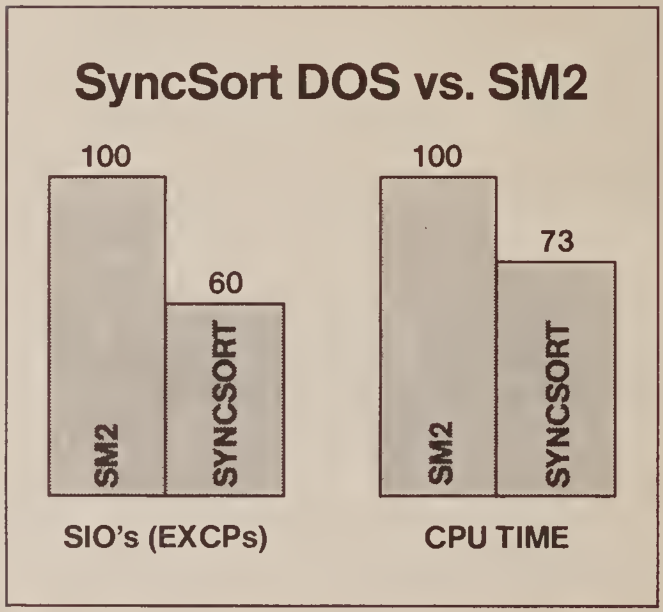

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SOFTWARE & SERVICES

SOFTLINE
Bao Nguyen

SQL spoken here

The huge applications software backlog at most MIS shops creates two serious problems: It works as a brake on the ability to achieve productivity gains in other areas, and it creates a situation that facilitates the production of bad software.

Research has shown that the computer language used in programming is one of the three major variables affecting programmer productivity.

One of the biggest advantages of the relational data base model is the availability of high-level query languages. Of these, the most widely used today is SQL. It was developed by IBM for SQL/DS and is used in IBM's DB2.

SQL simplifies the task of handling data for a relational data base management system. SQL also makes data query, report writing and data manipulation facilities available to a wide variety of users.

SQL commands cover a broad range of functions, and they can be used directly from display terminals or embedded in application programs written in languages such as Cobol, PL/1, assembly and soon in Ada.

SQL is well suited for use with data subject to query activity. It enables users to access data directly, without the need for a user-written application program. Multiple users can access data simultaneously, query and manipulate data or create reports while others are working with other data in the same tables.

SQL commands can accomplish many common data processing activities, such as locating and updating a certain item or group of items, sorting data and performing calculations using values

See **SQL** page 28

Nguyen is an information systems expert for the Air Force Assistant Chief of Staff/Systems for command, control, communications and computers.

Users applaud Ingres 4.0

Performance gains cited, only one hitch reported

By Eddy Goldberg

Three users of Version 4.0 of Ingres, the relational data base management system and fourth-generation language released six months ago by Relational Technology, Inc., are finding that the system is measuring up to the claims made for it.

At Nestle Enterprises, Ltd. in Toronto, Ingres Version 4.0 is being used on a Digital Equipment Corp. Vaxcluster, consisting of a VAX 8600, two VAX 780s and "a slew of Microvaxes" to develop applications, including manufacturing systems, said Michael Davidson, manager of systems development.

"Jobs run much faster, screens come up faster and retrieves in the data base run faster," Davidson said.

Using the Teleprocessing 1 standard bank transaction benchmark and his own internal applications, Davidson found a minimum 35% to 40% boost in CPU performance and a decline in the direct I/O count when he compared Version 4.0 with the 3.0 version. "I was really surprised. It worked out a lot better than I expected," he said.

At the Canadian firm, MacDonald Dettwiler & Associates, Ltd. in Richmond, B.C., MIS manager Bud Dawson uses Ingres Version 4.0 on a VAX 780 for internal data processing functions, including human resources and accounting. He found a 30% to 35% overall system performance gain after installing Version 4.0.

The firm's data administrator, Hardy Reinert, said the biggest problem with Ingres is that it does not implement complex query algorithms. "If you have complex queries, you have to go through the data several times to achieve them. We're looking for nested queries and the implementation of null values," he said.

Dawson said the addition of assignable function keys allows developers to standardize those keys across different applications in the company. "It may have been a small thing from a development point of view, but it sure is a good thing for our users," he said.

At Genrad, Inc. in Bolton, Mass., development engineer Keith Manning put Ingres Version 4.0 through his own series of performance tests on a VAX 750, using five sample queries he said he felt represented his applications.

For CPU-intensive queries, he noticed average performance gains of 20% to 25%,

See **USERS** page 28

SOFTWARE NOTES

CDC division goes software route

Business Information Services, the division of **Control Data Corp.** obtained in 1973 as the result of an antitrust action against **IBM**, is about to undergo another transformation, this time becoming a software vendor.

The Greenwich, Conn., computer services company will offer its most popular applications as software packages, beginning with Marksman, a series of modules for sales, marketing and advertising executives; Activator, a system used by process manufacturing companies; and Yield Management, a set of modules for travel and hospitality companies.

See **NOTES** page 26

CICS tester rates high efficiency

By Charles Babcock

BIRMINGHAM, Mich. — Two users say the new version of a tool for testing CICS programs is easier for application programmers to use than its predecessor.

Compuware Corp. of Birmingham is offering the product, Release 2.1 of CICS Playback. It was designed to enhance the stability of CICS systems by conducting regression and stress testing before the systems go into production, said Michael Lobsinger, vice-president of the Systems Software Division of Compuware.

CICS Playback captures production-type transactions and stores them in a special VSAM file, from which they can be called up for a simulation run of the application. "You can rerun them at will. It makes it easy to test," said Mary Lawson, CICS systems programmer at the Signature

See **CICS** page 26

INSIDE

Cullinet to support SQL/**26**

Consilium, Inc. enhances its Work-In-Process software/**28**

NEW THIS WEEK

- Stratus upgrades its operating system
- Target Systems offers Target Sales software for VAX
- For more on these and other new products, see pp. 75-80.

INSTANT ANALYSIS

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Cullinet announces SQL support, shies away from DB2

By Charles Babcock

WESTWOOD, Mass. — Cullinet Software, Inc. has made it official: The company will provide support for IBM's SQL in its products. But it has no intention of taking the next step that has proved logical to other companies, to provide support for IBM's DB2, Cullinet officials said after making the recent announcement.

SQL is the query language used to access data in IBM's relational products, DB2 under the MVS/XA operating system and SQL/DS under the VM operating system.

"Support of the SQL standard is a key element in our systems software product strategy," claimed David Litwack, senior vice-president of product development for Cullinet.

SQL support will first be introduced in Release 10.2 of Cullinet's Online Query product scheduled for beta testing in October of this year. Online Query accesses data in Cullinet's IDMS/R data base management system, and the product will be given the capability of using SQL's Select statement in the initial implementation.

Cullinet also plans to provide the capability of embedding SQL statements in Cullinet's Application Development System, which would allow customers to define and use tables in IDMS/R. It also plans to provide support for use of SQL in Cobol, but on both of the latter commitments, Cullinet declined to project when the support would be available.

"Everyone seems to be saying the same thing," said Chris Mortenson, senior analyst with Alex Brown & Sons in New York, commenting on the rash of announcements of support for SQL and DB2 from independent software houses.

"It's hard to tell what degree of support and integration will take place. It's one thing to offer SQL as an option and another to embrace it and make it part of your product line," he said.

Vendors of software for minicomputers, such as Oracle Corp. or Relational Technology, Inc., have accepted SQL as a standard throughout their products in contrast with the more piecemeal approach, he said.

Cullinet has stopped short of saying it will also make its products compatible with DB2. As a vendor of its own relational system, the company will continue to compete with IBM in that arena, according to company spokesmen.

Cullinet's support for SQL was broadly hinted at in its announcement of the acquisition of Esvel, Inc., a San Jose, Calif., vendor of a relational data base management systems for the Digital Equipment Corp.'s VAX line. Esvel's expertise in developing products that support SQL will be used to enhance IDMS/R, Cullinet spokesmen said.

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PROGRAMMING SOLUTIONS FROM ESTABLISHED EXPERTS

CICS tester rates high efficiency

From page 23

Group in Schaumburg, Ill.

By running the transactions through a test, the tester can get an idea of how efficiently the application runs. The monitor program in CICS evaluates the test transactions like a production run, yielding measures of CPU cycles, I/O demands and response times, Lawson said.

The previous release was run from a single CICS screen; the current release has a menu selection process that makes it easy for an applications programmer to invoke a CICS test without the aid of a systems programmer, Lawson said.

David R. LaRue, CICS systems programmer at MCI Corp.'s data center in Rockville, Md., also uses the new release of CICS Playback and said its ability to run a simulation of a CICS application without tying up dozens of user terminals is a big plus. The new release includes a facility to create virtual terminals for the simulated run, eliminating the need to tie up actual terminals for testing, he said.

CICS Playback is available immediately. It is priced from $12,500 to $25,000, depending on CPU size.

Notes: Pansophic to buy Fusion

From page 23

Pansophic Systems, Inc. has signed a letter of intent to acquire **Fusion Products International, Inc.** of San Rafael, Calif., in a stock transaction valued at $7.2 million. Founded in 1981, Fusion is a developer and marketer of information retrieval and report writing systems with data dictionary, query and personal computer links for IBM System/36 and 38 computers.

■

On-Line Software International, Inc. has named Howard P. Sorgen, 48, as president and chief operating officer. The position is a new one at On-Line Software. The position of president was previously occupied by Jack M. Berdy, 39, company founder, who retains the title of chairman.

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SQL spoken here

From page 23

obtained from sorted data.

Putting such activity in SQL commands instead of in an application program uses the power of the DBMS effectively and reduces data handling by application programs. An application program can sometimes be replaced by a few SQL commands executed from a terminal.

IBM's primary objective in developing SQL was to enhance the productivity of people who work with data. With SQL this is done by the following:

- Requiring minimum preplanning.
- Requiring minimum skill levels.
- Providing data access to professionals not trained in data processing.
- Reducing program maintenance caused by changes in data management.

After several years of usage, users, overall, give high marks to SQL, but some think it is a little difficult for non-DP professionals. In practice, SQL is commonly used by application programmers and managers, but all users like it because of faster systems development.

There are several reasons to adopt SQL as a standard. It is an easy-to-learn and easy-to-use English-like language. Improved ease of use is directly related to increased productivity.

It has been in the public domain since 1979 and is widely used by DBMS vendors. SQL offers better system performance because the programmers not only produce and fix more code, they produce better code.

SQL has better program portability. It offers interoperability and improved data sharing between systems by either facilitating direct access by one system to a data base maintained by another system or by maintaining separation of data bases but facilitating the means by which one system furnishes data to another.

Because it is easier, ad hoc processing provides increased user participation resulting in more timely availability of data. SQL better uses the limited and expensive time of trained professional programmers. Data is easily converted when changing hardware.

Major DBMS vendors now support SQL in addition to their existing data access language.

The European Computer Manufacturers Association Remote Data Base Access Service and Protocol Specification also makes use of SQL, which is currently the subject of standardization by both the American National Standard Institute and the International Standard Organization.

E. F. Codd, the originator of the relational concept, is very concerned with the lack of support for some important features and numerous restrictions.

I fully support Codd in his appeal to have the standard modified to be more faithful to the model before its ratification.

WIP-A version tracks assembly production

Bill of materials function added

By Rosemary Hamilton

MOUNTAIN VIEW, Calif. — Consilium, Inc. recently introduced a version of its Work-In-Process software, which it has marketed exclusively to the process industry for assembly manufacturers.

A bill of materials function, which will allow assemblers to trace components used in production, has been incorporated into the vendor's Work-In-Process Advanced (WIP-A) module.

WIP-A is one of 17 modules that make up Consilium's Comprehensive Online Manufacturing & Engineering Tracking System software that runs on Digital Equipment Corp. VAX and Microvax computers.

The bill of materials function has been added at no extra cost, the vendor said.

The WIP-A ranges in price from $62,500 for a Microvax license to $210,000 for a VAX 8600 license, according to the vendor.

Prior to this announcement, Consilium marketed WIP-A to process manufacturers, such as semiconductor makers.

The software enables users to keep track of the various stages of processing, from lot creation to the shipping of finished goods.

In addition to those capabilities, assembly manufacturers now are said to have the option of tracing individual components, which helps users control the quality of assembled goods.

Reporting system bows

DALLAS — Uccel Corp. has announced a Summary Reporting System and a float management capability for its item processing software used by financial institutions.

The Summary Reporting System controls the process and reporting of data in five areas: items per institution, operational work flow, item processing, rejected item analysis and item research, according to P. J. Hoke, director of marketing communications.

The reporting system is an enhancement to Uccel's Infopoint:Super Micr item processing software.

The float management capability added to Infopoint: Super Micr allows a financial institution to calculate and manage float with more flexibility, Hoke said.

The Infopoint series consists of 20 applications for managing deposits, transactions, customer loans and financial management.

With the enhancements, it will retail for $67,000 running under IBM's DOS operating system and higher prices for MVS versions, according to Hoke.

Users rate Ingres 4.0

From page 23

but for one disk-intensive query, the newer release actually was slower than Version 3.0.

The test query asked the system to count all the records in each one of five tables in his data base.

Manning said Ingres Version 4.0 ran about 5% slower than the 3.0 version in this test.

He said he suspected the reason it ran slower is that Ingres Version 4.0 performs more locking on the data than the Ingres 3.0 version.

Increased lock quota

Manning said that Relational Technology recommended increasing the quota of lock requests for each user account with its Ingres Version 4.0, which he did not do.

He wanted to compare the two versions with as few changes as possible.

Increasing the quota of lock requests also allocated more system resources to Ingres users, which initially he decided against, Manning added.

Users wait for resources

However, when users hit the limit on their allocated resources, they must wait for system resources to be free.

Increasing the quota would probably make the test run as fast or faster under Version 4.0, according to Manning.

Another query showed what Manning called a dramatic improvement, which reportedly reduced the 72-sec. retrieval time required with Ingres Version 3.0 to only 30 sec. with the later release.

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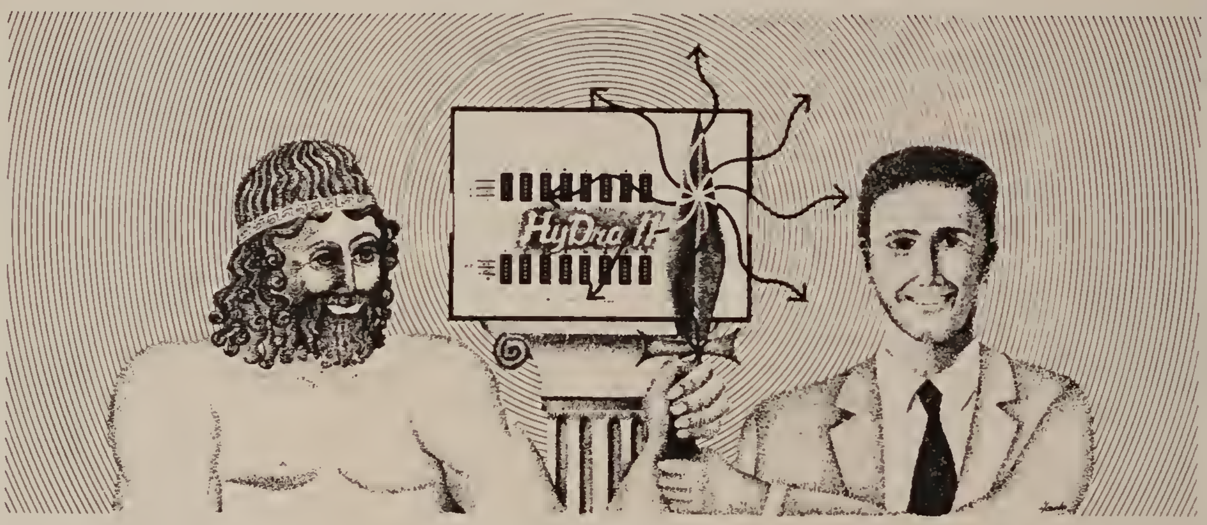

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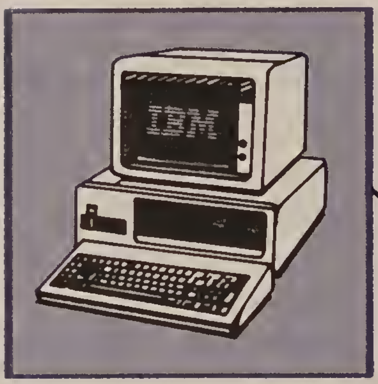

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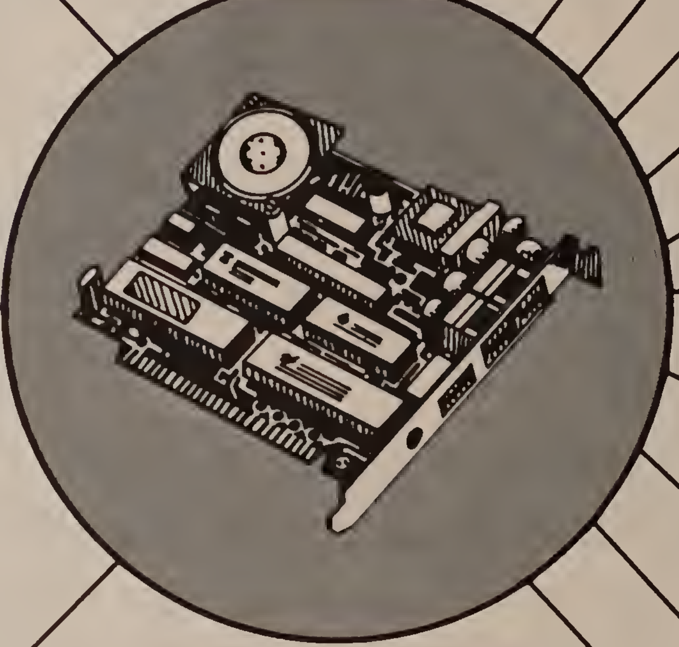

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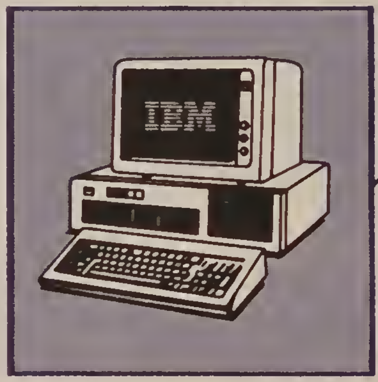

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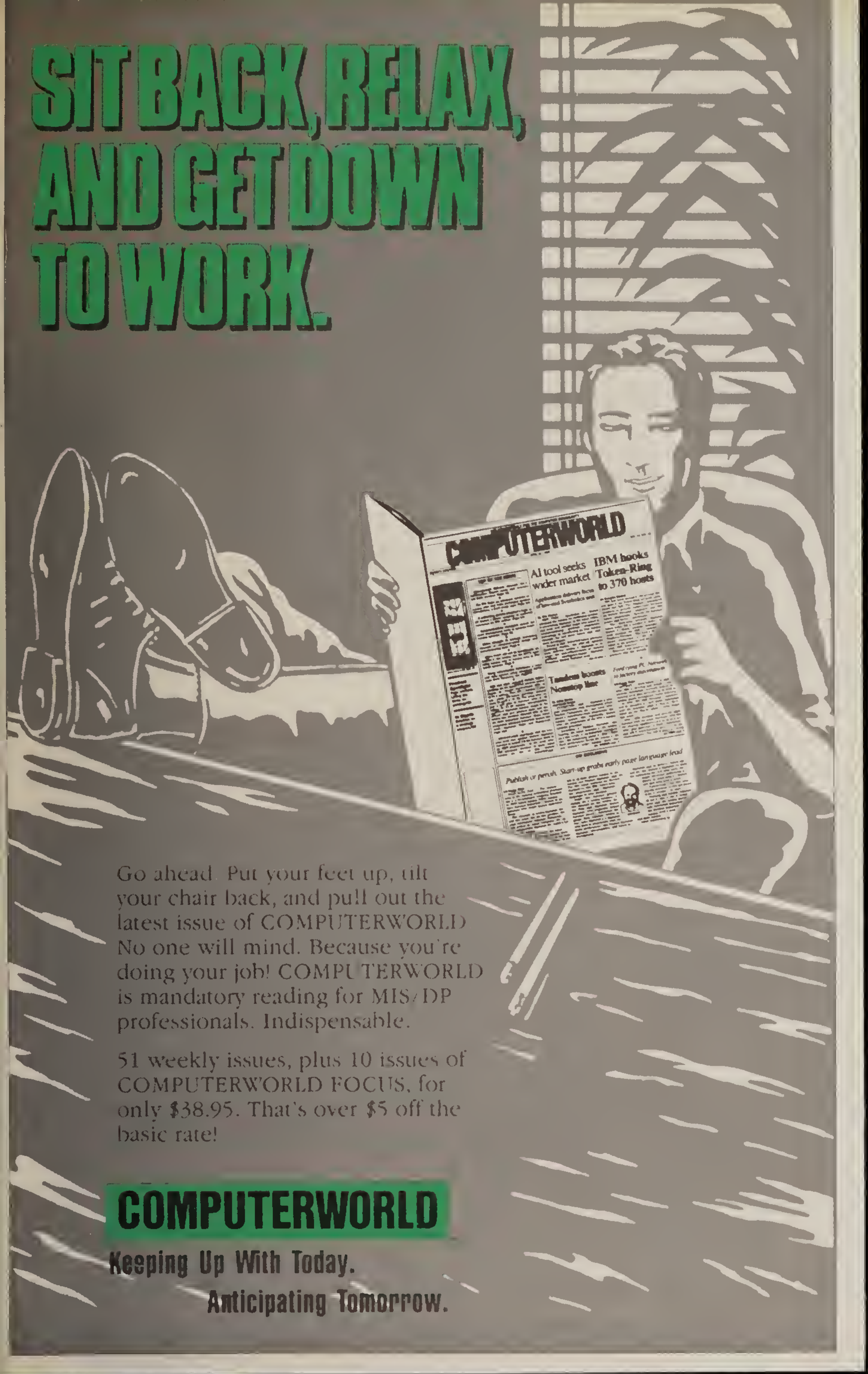
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MICROCOMPUTERS

SMALL TALK
James A. Fletcher II

In defense of Compaq

Alas, lately, much of the computer industry and almost the entire financial community appears to be worried about poor little Compaq Computer Corp. In what seems like countless publications, Wall Street and industry analysts alike are describing how Compaq is going to get caught in the cross fire as IBM wages a price war on the low-cost clone vendors.

Not to worry, ye of little faith. Compaq will not only prosper during this new era of the personal computer hardware business but will continue to enjoy substantial growth. Of course, it will not duplicate the meteoric rise in revenue accomplished from 1982 through 1986. But what company in any industry could?

Why will Compaq be able to rise above these market dynamics? Foremost, Compaq has demonstrated intrinsic strengths that make the kind of stumbling and problems hinted at highly unlikely, and the elasticity of the PC hardware business will surprise both market researchers and analysts.

Compaq has consistently shown an ability to precisely execute that which evades all other PC vendors. Whether it is Compaq's original Portable being able to create a completely new component of the PC market, its skill in establishing the best dealer network in the industry, its upping the ante of desktop computing with the introduction of the Deskpro series or its setting a new stan-

See **IN** page 35

Fletcher is a Houston-based management and technology consultant who specializes in end-user computing and information management.

DG rolls out AT compatible, aims to retain market share

By Rosemary Hamilton

WESTBORO, Mass. — Data General Corp. introduced an IBM Personal Computer AT-compatible system recently, a move one analyst termed part of a trend among minicomputer vendors to minimize IBM's impact on their low-end business.

"Data General and the others are facing an issue: The IBM Personal Computer family has become the accepted terminal," said Jay Stevens, first vice-president at Dean Witter Reynolds, Inc.

"Digital Equipment Corp. has found that out, and DG is finding the same thing. They have to offer an IBM compatible, or they'll lose a piece of their business," Stevens said.

DG's Dasher/286, based on the Intel Corp. 80286 microprocessor, had a low-key debut as part of a DG press conference that focused on the firm's recently introduced engineering software products.

The PC AT compatible, with an entry-level price of $3,395, operates at a clock speed of 10 MHz, 25% faster than the IBM PC AT, the vendor said. It comes standard with 640K bytes of memory, whereas the IBM PC AT comes standard with 512K bytes, and it also reportedly has a 30% smaller footprint than the IBM model.

"What Data General has done is not unique," Stevens continued. "DEC has found that within its installed base there are a lot of IBM PCs."

DEC has been expected to announce an IBM PC AT-compatible system by year's end, possibly as early as next month.

The Dasher/286 will be offered as a general-purpose personal computer, but DG said it will emphasize the system's role as an extension to the Comprehensive Electronic Office (CEO) product line, according to John Barlow, manager of personal computer product marketing.

CEO is a DG software environment that provides integrated office productivity tools to a network of DG systems. Dasher/

See **DG'S** page 34

Expert tools brought within reach

AI show features packages for nonexpert developers

By Eddy Goldberg

PHILADELPHIA — An abundance of inexpensive micro-based products that allow casual users to develop expert systems were displayed along with more complex programming packages at the recent AAAI-86 show, the Fifth National Conference on Artificial Intelligence.

Softsync, Inc. of New York released an expert system development package that uses a spreadsheet-like interface enabling nonprogrammers to create expert systems without programming or entering rules. Superexpert, which runs on the IBM Personal Computer and Apple Computer, Inc. Macintosh, comes in three versions with varied levels of capability and costs from $199 to $1,200.

Whereas traditional expert systems require users to enter a large body of rules to solve a problem, thereby creating an expert system out of those rules, Superexpert accepts a set of examples and induces its own rules.

A link to another Softsync program, Reports Plus, has been built into Superexpert. Reports Plus is a query system and report generator that can select data from popular spreadsheet programs and data bases. For an introductory price of $99, it reportedly allows users to easily select only the information they require from files and present it in a report of their own design.

Softsync also has renamed Expert-Ease for the IBM PC and cut its price from $695 to $99. Now known as Expert One, the expert systems development package also

See **EXPERT** page 34

NEW THIS WEEK

- Computer Peripherals offers voice-controlled enhancement board for PCs
- For more on this and other new products, see pp. 75-80.

INSTANT ANALYSIS

"The leap from 80286 to 80386 technology is going to be about as significant as was the jump from CP/M to MS-DOS."

— Michael Crosno, vice-president of marketing, Computer Associates, Inc., Micro Products Division

Oracle's SQL★Calc makes a relational DBMS as easy as 1-2-3.

Oracle Corporation has developed a Lotus 1-2-3 compatible spreadsheet and integrated it with its ORACLE® relational database management system (DBMS). The new product, SQL★Calc,® is the first to combine a mainframe-class relational DBMS with an easy-to-learn and familiar PC spreadsheet user interface.

SQL★Calc is designed for 1-2-3 users who've run out of memory, flexibility and patience. SQL★Calc allows you to put SQL database commands into spreadsheet cells . . . just like formulas. This permits you to access large amounts of data directly from your spreadsheet.

Like all Oracle Corporation products, SQL★Calc runs identically on mainframes, minicomputers and PCs.

SQL★Calc's foundation is the ORACLE relational DBMS, which provides users with a complete set of SQL commands through which they can create, retrieve, modify and otherwise control their data. SQL is the industry standard database command language for large computers. The SQL commands available in ORACLE are identical to the SQL commands in IBM's premier mainframe relational DBMS products, SQL/DS and DB2.

Built on this powerful DBMS foundation is a Lotus 1-2-3 compatible spreadsheet that allows users to put SQL commands into spreadsheet cells in the same way as they enter formulas. When a SQL command for data retrieval is entered into a spreadsheet cell, information is automatically retrieved from the database and placed into the spreadsheet. SQL★Calc also permits users to modify the database–and even create new database tables–directly from the spreadsheet.

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SQL★Calc is easy to learn because its menu and command structure are compatible with those of Lotus 1-2-3. And SQL★Calc's ORACLE DBMS requires no supplement: It is vastly more powerful than the database components of 1-2-3, Symphony, Framework, dBase II, dBase III, or any other PC DBMS.

SQL★Calc is available immediately for IBM PC/XTs and ATs for $995.* SQL★Calc will soon be available on a wide variety of systems, including IBM mainframes, DEC, DG, and other superminis, and most UNIX systems.

For further information, or to order your copy of SQL★Calc, call 1-800-345-DBMS. Or write Oracle Corporation, Dept. CS, 20 Davis Drive, Belmont, CA 94002.

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Expert tools within reach

From page 33

uses a spreadsheet-like format for the entry of examples. Expert One is an inductive rule generator, which allows the user to enter examples of decisions from which rules are induced.

Programs in Motion, Inc. of Wayland, Mass., unveiled Version 3 of its 1st-Class expert system tool for the IBM PC at AAAI-86.

Another spreadsheet-like expert system development package, 1st-Class allows expert system developers to build forward- and backward-chained expert systems by entering examples or by building rules on a graphic decision tree.

The new version adds three advanced features. Global variables let a factor's values carry over to other rules in a chained system, allowing a user to answer a question only once, instead of whenever it is asked.

Other features include improved report generation, which allows for testing, debugging and refining the knowledge-base design; and a trace facility that permits developers to try sets of example data or rules and immediately test the effects on expert system performance.

1st-Class Version 3 requires an IBM PC or compatible with a minimum 256K bytes of memory and IBM PC-DOS 2.0 or above. It is not copy protected and can be used with a hard disk. It is priced at $495 and is available now. A demo disk can be purchased for $20.

Clisp, a fully functional LISP library and programming environment for the C language, is now available from Frederick J. Drasch Computer Software of Ashford, Conn. It is priced at $189 and will run on the IBM PC, Personal Computer XT and AT with either the Microsoft Corp. or Lattice, Inc. compiler.

Clisp will allow the addition of intelligence to existing programs or the construction of hybrid programs combining the power and portability of the C language with the symbolic processing capabilities of LISP.

Clisp is written entirely in C, is Common LISP-compatible and consists of more than 100 functions, including all LISP primitives, predicates and conditionals, association lists and property lists and an interpreter with hooks to add user-written functions.

> ”
>
> ***Clisp will allow the addition of intelligence to existing programs or the construction of hybrid programs.***

Systems Designers Software, Inc. of Woburn, Mass., is offering Sage, its expert system shell, for $99 during the month of August. Sage, which normally retails for $499, is available for the IBM PC and compatibles.

Systems Designers is also offering a $499 credit toward the price of Envisage, its expert system shell for the Digital Equipment Corp. VAX VMS environment, to anyone who purchases Sage at either $99 or $499 before Feb. 28, 1987.

Envisage costs from $15,000 for the Microvax to $40,000 on the VAX 8600.

DG's AT compatible

From page 33

286 users will have access to CEO residing on a DG host with the CEO Connection software, which sells for $295 per Dasher license.

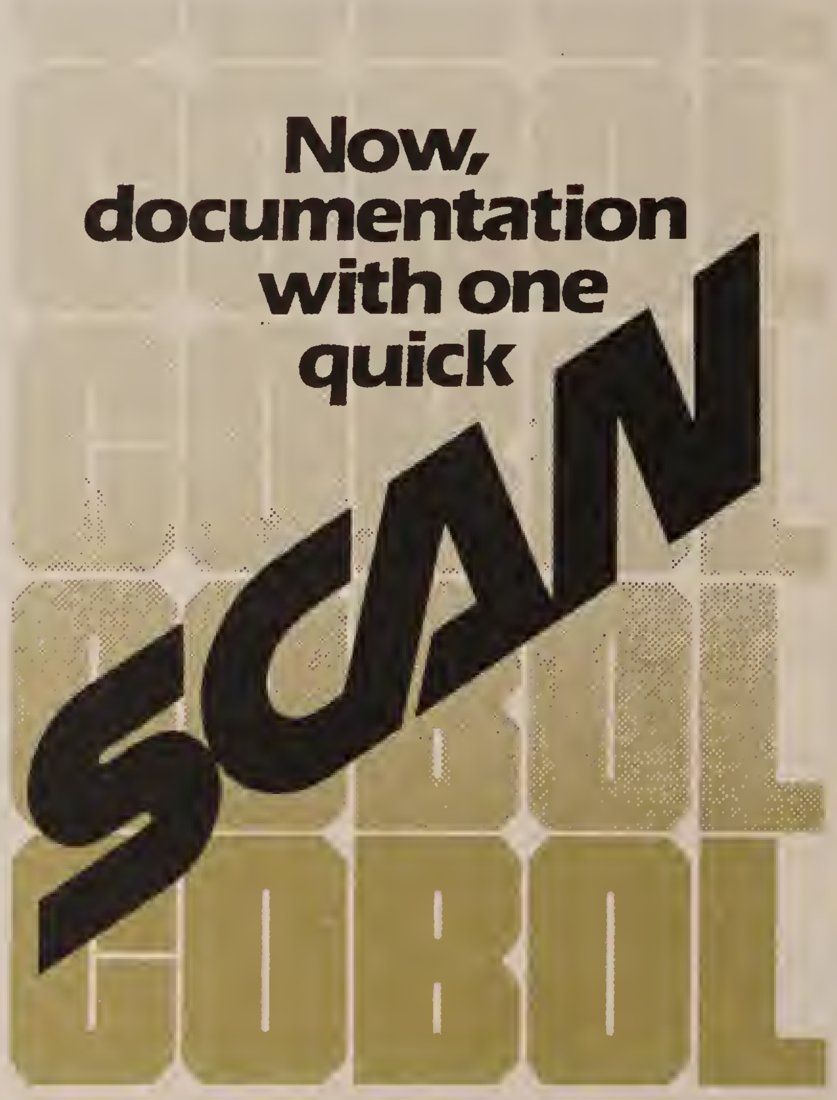
The system also comes bundled with Microsoft Corp.'s MS-DOS 3.1, making it software compatible with the IBM PC AT.

In addition to the 640K bytes of main memory and MS-DOS 3.1, the standard system comes with a 1.2M-byte floppy disk drive, two serial ports and a parallel port.

The same system with a 20M-byte hard disk sells for $4,095.

Dasher/286, which is expected to ship within 60 days of order, comes with either an IBM PC AT-style keyboard or a CEO keyboard.

It is reportedly available in a desktop or floor-mounted version.



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In the defense of Compaq

From page 33

dard for transportables with the Portable II when the old standard appeared quite adequate, Compaq's talent to move on ideas, user requirements, market trends and the availability of new technology has made this company different from the rest.

More important, though, is not this past history of performance but the fact that Compaq's history translates into countless corporate and business buyers who believe this pattern of excelling and rising above the pack will continue and who maintain that, for them, Compaq is a safe bet.

Certainly Compaq will lose percentage market share; however, the company's dollar market share should not suffer to nearly the same degree. In the short term, Compaq's soon-to-be-announced system based on the Intel Corp. 80386 will certainly help the company withstand increased market pressures, as will its forthcoming laptop. In the meantime, the clone vendors will serve to demonstrate the significant elasticity that exists in the PC hardware business.

More than anything else, the low-cost clones are succeeding in opening up the bottom part of the market while at the same time adding to overall market confusion. My research points to the reality that clones are primarily being purchased by price-sensitive buyers and technical buyers who are willing to put up with the uncertainty of doing business with a clone manufacturer vs. an established compatible manufacturer.

Overall, the aggregate market expanding to accommodate both of these groups of buyers is good for the microcomputer industry as a whole. In the long run, with the obvious exception of IBM, many vendors will benefit from the increased competition and choices, and users of all types will also benefit. In some cases, members of the traditional group of business purchasers that have been Compaq's primary customers will move into the more price-sensitive purchaser group.

A well-considered response

Although Compaq has to address problems that increased competition will bring, the company realizes just how unforgiving the microcomputer marketplace is and can be counted on to respond with well-considered actions and product introductions.

One of the most visible examples stems from pricing pressures as clone prices drop and major suppliers adjust their prices in response. Compaq's steady increase in gross margins, which now exceeds 40%, should give it plenty of room to respond. Moreover, Compaq's talent for introducing products that are both well positioned and well timed should bolster margins that will suffer from price cuts on current products.

Additionally, Compaq is going to have to come to grips with the changes that are developing in the dealer distribution system that has served it so well to date. These changes have the potential of becoming a much more severe problem than the requirement to respond to price-cutting pressures.

Moreover, the complexities of the conventional dealer distribution system's evolution is still very much a mystery, regardless of what dealer executives say.

Tools emulate IBM, Tektronix workstations

Attachmate Corp. and Grafpoint Co. each introduced terminal emulation software packages last week.

With Attachmate's IBM 3270 Personal Computer Emulation Program, users can put up to four active mainframe sessions, two notepad programs and an IBM PC-DOS application into windows. The $395 program also supports IBM products such as the host-based file transfer, Personal Services/PC, and the 3270-PC Application Program Interface.

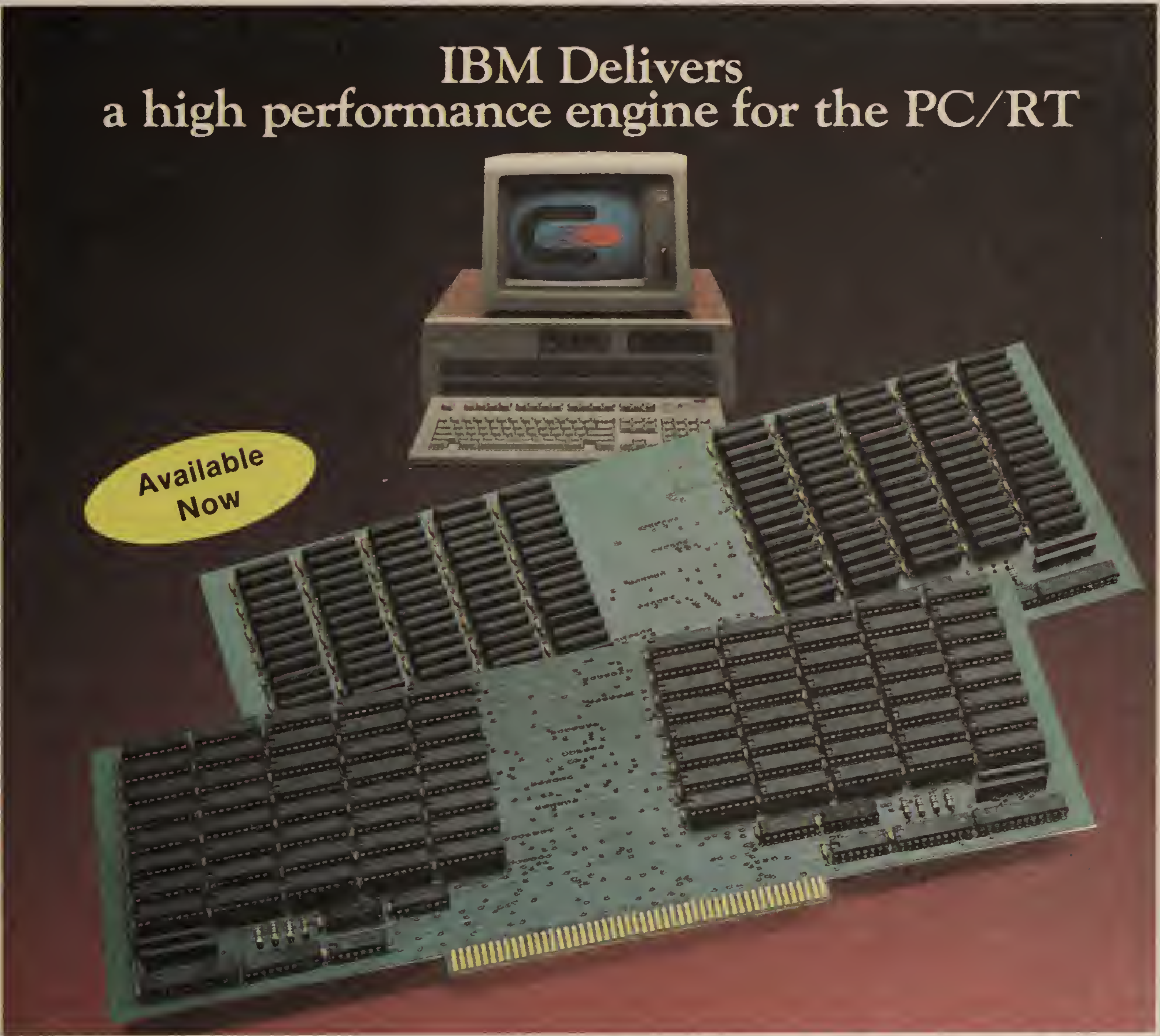
Attachmate's 3270 Host Graphics Program allows high-resolution mainframe graphics to be displayed, edited and printed on the Personal Computer. This $595 graphics option requires no additional hardware and is compatible with both IBM's standard Color Graphics Adapter and its Enhanced Graphics Adapter.

Both programs are now available for use with IBM's 3278/3279 Emulation Adapter.

Grafpoint's Tgraf-15 enables IBM PCs and compatibles to emulate the Tektronix, Inc. 4115 graphics terminal. According to Grafpoint, a fully configured IBM PC with a graphics board and Grafpoint software costs only half as much as a comparable dedicated graphics terminal.

Depending on the color graphics board used, Tgraf-15 can create images of up to 1,280 by 1,024 pixel resolution with 256 colors out of a palette of up to 16 million colors.

Shipments of the $1,995 Tgraf-15 are set for November.



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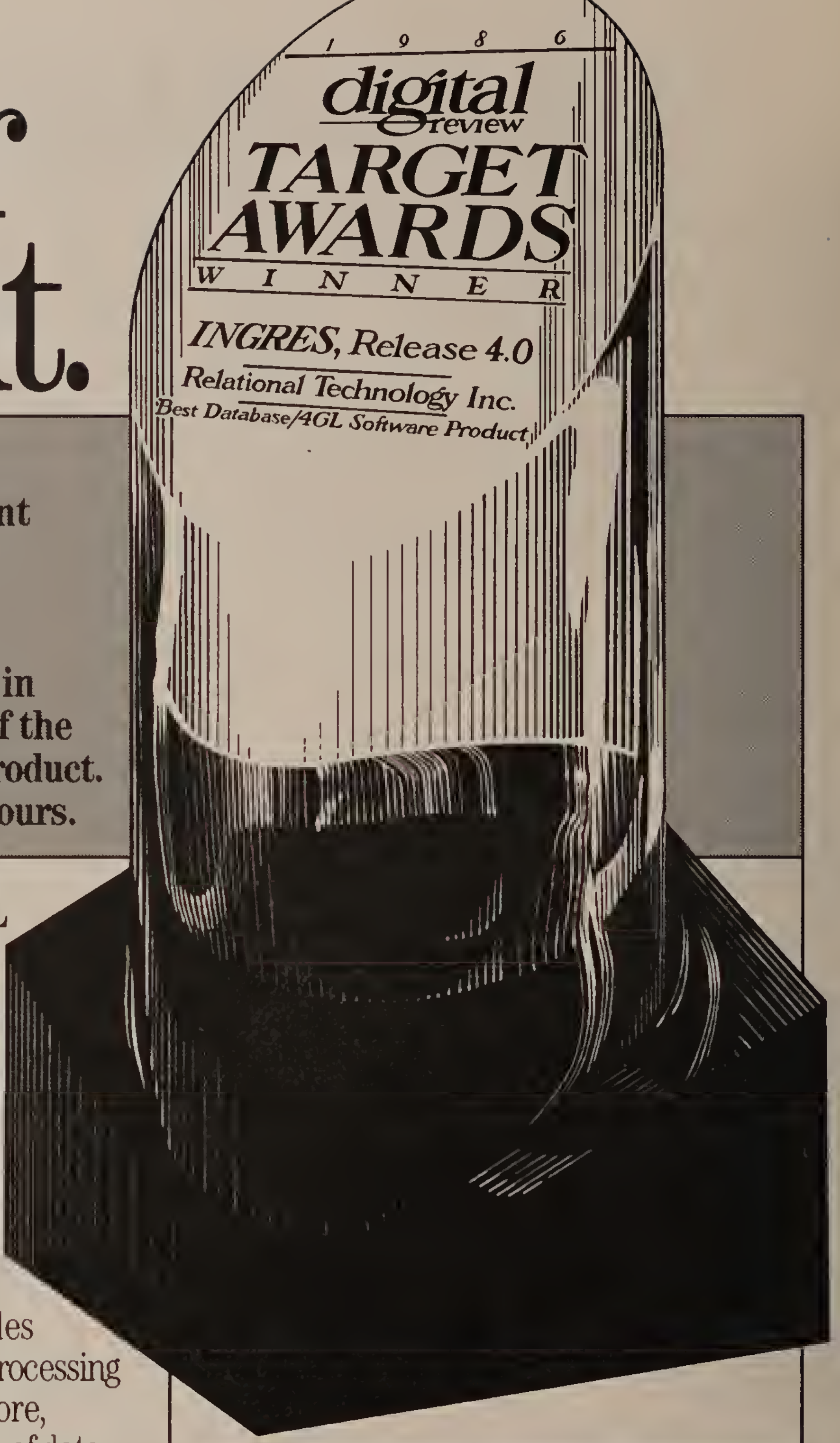

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Ottawa	Oct 30
Quebec	Sep 10
Toronto	Nov 13
Winnipeg	Oct 14

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*1986 Computer Intelligence Corp. survey of 7000 VAX sites. Market share: INGRES 44.8%, DEC 29.6%, Oracle 25.6%.

SYSTEMS & PERIPHERALS

HARD TALK
James Connolly

Rumors fly about 4300s

Rumors can be laughable. They can be scary. Classify this one as intriguing.

It is the type of rumor — actually an outright statement by a fairly well-placed source — that makes one think, "Nope, they'd never do that. But then again. . . ."

The report came out of IBM a couple of weeks ago: IBM is telling its Marketing Assistance Program participants that it is pulling its 4300 family out of the commercial DP market in favor of the System/38 — including a new, more powerful System/38 model — and is targeting the 4300s toward customers in the engineering and scientific fields.

Analysts and consultants quickly said there was no way that the report was true. IBM quickly said it doesn't comment on that type of report.

But even assuming that the original report is off base, it does provide fodder for speculation about where the 4300s are bound, and there are arguments to be made for aspects of the scenario.

Marty Gruhn, vice-president of the Sierra Group research firm in Tempe, Ariz., says she would be surprised if the rumor were true, particularly the part of the report that says IBM will take affirmative action to yank the 4361 and 4381 out of the commercial DP market. However, looking at the issue of steering potential 4381 and 4361 users toward the System/38, Gruhn notes that the System/36 and 38 remain the key subjects of IBM's midrange strategy.

See **RUMORS** page 40

Connolly is Computerworld*'s senior editor, systems & peripherals.*

Motorola stresses diversity

Faster 68020 chip pushed for general systems use

By David Bright

While the first implementation of Motorola, Inc.'s 25-MHz MC68020 microprocessor is in a technical workstation, the high-performance 32-bit chip should soon be speeding up general-purpose systems as well, company and industry sources say.

Motorola recently boosted the top speed of the chip from 20 MHz to 25 MHz. The chip is also offered in 12.5-MHz and 16.67-MHz versions. In addition, Motorola raised the top speed of its 68881 floating-point processor from 16.67 MHz to 20 MHz. According to Jeff Nutt, manager of technical marketing for Motorola's 68000 family, the recently released 68020 offers seven times the performance of a basic 68000.

Both the faster 68020 and 68881 are used in Sun Microsystems, Inc.'s 4 million instructions per second (MIPS) 3/200 series workstations, introduced earlier this month [CW, Aug. 11].

Concerning the types of systems in which the MC68020 can be used, Nutt says the benefits of the faster chip will be across the board. In addition to technical workstations, systems incorporating the chip should include general-purpose systems accommodating more users, factory robots with faster-moving arms and telephone switching systems that need to handle more calls. "Each time we increase the performance, our customers find ways of using it," he says.

Until systems are able to provide an instantaneous response, there will always be a demand for more powerful chips and systems, according to Nutt. "When I'm sitting there and I call up a file or a screen and I have to wait five seconds, that's eternity. I want instantaneous response, and I think everybody else in the business wants instantaneous response."

Because of the constant demand for more power, Motorola is currently working on its next generation of microprocessors, Nutt says. However, he cannot yet reveal any performance estimates for those chips. Industry observers have called those chips the 68040 family, although

See **MOTOROLA** page 40

DATA VIEW

Report card

Users rate Prime Computer, Inc. and Hewlett-Packard Co. best at minicomputer maintenance.

Responsiveness:	Weighted Average	Users Answering
Prime	3.68	76
HP	3.58	291
NCR Corp.	3.56	92
Tandem Computers, Inc.	3.53	30
IBM	3.50	939
Effectiveness:		
HP	3.58	291
IBM	3.55	939

Rankings based on a February 1986 Datapro Research Corp. survey of 2,338 users asked to rate vendors on a 1-4 scale.

Larger sites favor uninterruptible power supplies

By Donna Raimondi

LA JOLLA, Calif. — Uninterruptible power supplies (UPS) are either planned or installed at 65% of all computer sites with 5,000 or more remote terminals, while only about 20% of sites with 100 to 250 terminals have or plan a UPS acquisition.

These UPS acquisition patterns were discovered in a recent study by Computer Intelligence Corp., a La Jolla market research company.

The survey examined 18,000 sites over a four-month period, said Thomas Young, market analyst at Computer Intelligence. Approximately 50% of the sites surveyed

See **LARGE** page 44

INSIDE

Charles River Data Systems announces supermicrocomputer additions to its Universe line/**44**

Intergraph releases dual-CPU configuration of its Microvax II-based graphics system/**44**

NEW THIS WEEK

- Toshiba introduces 24-pin, wide-carriage dot matrix printer
- For more on this and other new products, see pp. 75-80.

INSTANT ANALYSIS

"The System/36 and the System/38 have become, in IBM parlance, the System/36-38 family, and that is significant for those product lines."

— Per Flaatten, technology research manager for Arthur Andersen & Co.

User firm's benchmarks support VLX performance claim

Tests confirm Tandem software compatibility

By Jeffry Beeler

CUPERTINO, Calif. — Benchmark tests by a Milwaukee-based user of Tandem Computers, Inc. systems recently corroborated the vendor's performance claims for its VLX high-end transaction processor.

In a test that A. O. Smith Data Systems, Inc. ran at Tandem's Cupertino headquarters in June, a VLX-based configuration reportedly provided twice the throughput per processor of the hardware supplier's next largest machine, the TXP.

"Our benchmark results put the VLX very much smack in the middle of the performance range that Tandem initially claimed for the machine," A. O. Smith's Vice-President of Product Development Walter Hadcock said during a recent telephone interview.

The tests also put to rest any doubts A. O. Smith had about whether its software written for other Tandem machines would run on the VLX, Hadcock said.

When Tandem introduced its latest top-of-the line system in April, it credited the VLX with processing on-line transactions 1.8 to 2.4 times faster than the nearly 3-year-old TXP.

A. O. Smith, a supplier of Tandem-compatible software for automated teller machine (ATM) applications and an ATM service bureau, furnished both the programs and raw data for its benchmark test, which was meant to simulate the workings of a shared ATM network.

In real life, a typical ATM transaction involves an intermediate processor that receives on-line traffic from a customer terminal and forwards the signal to a bank's host mainframe for authorization. After checking the user's account balance electronically, the host returns the transaction through the intermediate CPU to the originating ATM, which ends the process by sending a completion message to the middle machine.

In A. O. Smith's benchmark test, a four-processor VLX configuration played the role of the intermediate box, while an eight-CPU TXP system created the ATM work load and doubled as the authorizing host.

Roughly 10% to 15% of the ATM traffic was composed of simple inquiries about account balances. The rest of the work load, which was transmitted over a score of 9.6K bit/sec. lines, consisted of relatively resource-intensive transactions such as simulated funds transfers and cash withdrawals.

The mix of transaction types that A. O. Smith chose for its test is fairly representative of the kinds of traffic that typically occur over a commercial ATM network, Hadcock said.

After the VLX configuration had finished processing the work load it received from the TXPs, the test was repeated in reverse: A. O. Smith used the VLX system to simulate the ATM traffic and the TXP machines

See **USER** page 44

Rumors fly about 4300s

From page 39

"IBM's current thrust across its product lines is to focus its products in particular markets. It is positioning its products in those markets and trying to stop the confusion. The company really needs to clean up its act," Gruhn says, noting that some users remain unsure as to which midrange products IBM is committed.

But Gruhn also reports that the idea of a new, powerful System/38 to serve the near-mainframe needs of 4381 users doesn't fit in with what her firm has learned about IBM's plans. She predicts that System/38 users, whose product line was revamped as recently as mid-June, won't see a super System/38 for two years.

One observer who says he hadn't heard the rumor but does not dismiss it out of hand is Svend Hartmann, president of Computer Merchants, Inc., a Chappaqua, N.Y., used-computer dealer and computer lessor.

"The rumor is very plausible and the kind of direction that IBM would take. If I had heard it, I would say that it fits in with the overall strategy that IBM has had for quite some time. In a way, I think it is already happening. You see relatively little commercial activity in the 4361 area in particular," which has been concentrated for a while in the computer-aided design and manufacturing market, Hartmann says.

An Infocorp analyst, Sandra Gant, says she would be surprised if IBM announced that the 4300s were being pulled from a particular market segment. But she, too, notes that the repositioning has been occurring for some time and recalls that during a presentation in West Germany more than a year ago, IBM positioned the 4361 as an engineering computer.

"I think IBM has been trying to position the 4300 as an engineering departmental system to compete with the Digital Equipment Corp. VAX line," Gant says.

"From a price/performance point of view it makes sense to position the 4300s as engineering machines. But it doesn't make sense to just kill them as commercial machines," Gant says, emphasizing that IBM "lets its customers vote with their money" before the company decides which machines to promote and enhance.

The basic reason so many observers say they would be surprised to see IBM pull the 4300s out of the commercial market is that the product family, with the possible exception of the 4361, has been a tremendous market success in the seven years since it was introduced. There are a lot of 4300s installed in American companies, with many of them being used to run payrolls and accounting packages in addition to doing engineering work.

> **"**
>
> ***If IBM does kill the 4381 and 4361 as commercial DP machines, it runs the risk of alienating a lot of people who could find themselves with no way to upgrade their machines.***

The market research firm Computer Intelligence Corp. earlier this year counted almost 16,000 4300s installed throughout the U.S. That number includes not only the 4361s and 4381s that remain in IBM's current new product offerings, but also more than 1,800 of the older 4331s and more than 5,000 of the various 4341s, the last of which were removed from the active marketing list in February.

If IBM does kill the 4381 and 4361 as commercial DP machines, or even if the high- and low-end replacements for the 4300s that are expected during the next few months prove to be too new and different, IBM runs the risk of alienating a lot of people who could find themselves with no way to upgrade their machines and no way to recoup their losses on the used market.

"What you have to remember is that there are thousands of 4300s out there. Even IBM can't move that many people. They can migrate some of those people over a period of a lot of years, but there is no way they can move that many people into another product line with one or two announcements," comments analyst Charles Greco of the International Data Corp. market research firm in Framingham, Mass.

Finally, Per Flaatten, a consultant with Arthur Andersen & Co. of Chicago, says he, too, heard the report about limiting 4300 sales to the engineering and scientific users.

"I heard that rumor myself, and I do not think it sounds plausible at all. The 4300 is making money for IBM, and so is the System/38. The way the 4300 is going, it is a pretty popular choice for people who are down low and expect to grow," Flaatten says. He maintains that the 4381 shouldn't be taken out of the commercial market until there is a replacement as an entry-level system to the IBM MVS world.

Flaatten also notes that what might be in the wind and serving to fan the rumors is IBM's long-running goal of driving IBM DOS users, most of whom are in the commercial DP area, toward MVS. He theorizes that IBM may be preparing to penalize users who want to stay with DOS, with those penalties being either financial or functional in nature. Another source of the rumors, he says, could be the withdrawal of support for IBM ECPS, a hardware assist found primarily in older 4300s.

But if one continues to look at the rumors and the events of the past few months, there are other questions that arise in connection with the 4300s. They are questions that 4300 customers have a right to have answered.

The 4381s received mid-life performance kickers and price cuts in February, which led to widespread speculation that a CMOS-based replacement is due this coming February. But the question of compatibility remains.

Similar compatibility questions may be on the minds of 4361 users who have heard IBM talk about its Micro370 microprocessor, which is expected to be at the heart of a 4361 replacement within a few months.

When it revamped the System/36 and System/38 lines in June, IBM announced its 9335 disk drive as a replacement for the 3370 that has been used with the System/38. But unlike the 3370, the 9335 is incompatible with the 4300s.

More typical of the confusion that continues to reign in the 4300 market is that surrounding the introduction of the 3174 controller as part of the June 16 announcements.

The 3174 was billed as a replacement for the 3274 controller, but while the 3274 supported the full 4300 family, users are questioning whether the new controller supports all 4300s or just the currently marketed 4361s and 4381s. The questions focus on the support for the older 4300s.

IBM spokesmen in the Information Systems Group report that the 3174 was designed to support all 4300s and that even the oldest models of the 4300 product line can be attached without major changes. That is what IBM's headquarters says. Users in the field are getting different answers.

More than a hundred 4300 users reportedly have tried to order 3174s only to be told that systems such as the 4341 aren't supported by the 3174. Therefore, those orders have been placed on hold. That type of discrepency is why rumors about IBM's doings and undoings are so easily picked up and given credence.

Motorola stresses diversity of chip

From page 39

Motorola says it is not using that designation.

There is absolutely a need for more power in both individual and multiuser applications, agrees Richard Mikita, an analyst with International Data Corp., a market research firm based in Framingham, Mass. One of the next users of the 25-MHz 68020 could be Enmasse Computer Corp., a vendor of multiprocessor transaction processing systems, Mikita predicts.

But even the Apple Computer, Inc. Macintosh could be a candidate for the faster chip, especially in desktop publishing applications, Mikita adds.

Motorola rates the 25-MHz 68020 at 5 MIPS, with bursts reaching 12.5 MIPS. The 20-MHz 68881 floating-point processor performs more than 40 different floating-point functions.

Production shipments of the 25-MHz 68020 and the 20-MHz 68881 should begin in the fourth quarter of this year.

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state-of-the-art direct access storage devices. The new storage devices can quadruple capacity on one model of the System/36 and double it on the larger System/38's. And on the System/38 the new storage devices can take up less floor space.

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So whether you side with a System/36 or a System/38, or both, the best way to keep a growing business communicating is to keep it all in the family.

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User tests support Tandem claim

From page 39

to process it.

"The reason we benchmarked the systems in both directions is that we were more interested in gauging the relative throughput of the VLX and the TXP than we were in getting some absolute measure of their performance," Hadcock said.

In the first half of the procedure, when ATM applications were being executed by the VLX, the testers achieved a top processing speed of 50 transaction/sec. and a sustained throughput of 40 transaction/sec., he said.

In the second half of the test, when responsibility for the processing moved to the TXP, the observed performance peaked at 29 transaction/sec. and averaged 20 transaction/sec.

As a Tandem software house, A. O. Smith sells products that run on the TXP and the hardware vendor's other existing processor models, including the Nonstop II.

But prior to the benchmark test, the user organization was uncertain as to whether the same programs would also operate — without revision — on the VLX.

Test proved compatibility

Hadcock said that, to A. O. Smith's relief, the benchmark test proved the VLX fully compatible with the rest of Tandem's processor line.

"The software we used in our tests was identical to the products we provide commercially," Hadcock said. "Within an hour of the moment we walked in and saw a VLX for the first time, we had our programs up and operating."

> *'Within an hour of the moment we walked in and saw a VLX for the first time, we had our programs up and operating.'*
>
> — Walter Hadcock
> A. O. Smith Data Systems, Inc.

Although the test results were generally favorable, Smith has deferred thus far its decision on a VLX purchase.

"Right now, we still have some room to grow in the TXPs and Nonstop IIs we already have," Hadcock said.

"When our volume grows to the point where it begins to rub against our available capacity, we'll have to begin looking carefully at the VLX as our next possible acquisition," Haddock added.

A decision one way or the other on Smith's next CPU procurement will probably come during the fourth quarter, he said.

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Universe 32-bit supermicros debut with denser hard drives

By James Connolly

FRAMINGHAM, Mass. — Charles River Data Systems, Inc. has announced two 32-bit supermicrocomputers for its Universe series that feature denser hard disk drives and the ability for users to add more I/O devices, communications controllers, memory and peripheral interfaces.

The Universe 32/117 and Universe 68/117 are largely comparable with Charles River Data's earlier Universe 32/137 and Universe 68/137 systems, except that the new systems use 5¼-in. disk drives rather than 8-in. drives, and they offer seven expansion slots rather than five slots, according to a company spokesman.

The 32-bit Unix systems are based on Motorola, Inc.'s Versabus. The Universe 32/117 uses a 12.5-MHz Motorola 68020 microprocessor and executes 2.7 million instructions per second (MIPS), according to Charles River Data.

The Universe 68/117 uses a 12.5-MHz Motorola 68000 processor and is rated at 1.25 MIPS, the company spokesman said.

The systems are targeted at the same markets as the earlier Universe systems, including telecommunications, image processing, advanced controls and nonfinancial transaction processing applications.

The systems are available now in the end-user and OEM markets, the vendor said.

The systems are available in 10½-in.-high, rack-mountable packages, and feature 140M bytes of unformatted disk storage and a ¼-in. streaming tape backup unit.

The Universe 32/117 costs $34,000 with 1M byte of memory.

The Universe 68/117 is priced at $27,500.

Dual-CPU graphics unit out

By James Connolly

HUNTSVILLE, Ala. — Intergraph Corp. recently introduced a dual-processor version of its Digital Equipment Corp. Microvax II-based Intergraph 250 graphics system.

Intergraph, which sells interactive graphics systems based on DEC VAX systems and plans to sell a graphics system based on the Fairchild Camera and Instrument Corp. Clipper microprocessor, said that the dual-processor Intergraph 252 provides twice the power of the single-processor 250.

According to Intergraph officials, additional benefits of the dual-processor system include the ability to access data on dual-ported disk drives from either CPU.

Cost-saving benefits

Another benefit is the ability to save money on some software license fees because the two CPUs are sold as a package.

The 252 consists of two Microvax II CPUs in a three-rack cabinet, 16M bytes of memory per CPU, a 337M-byte disk drive for each CPU and room for six rack-mounted disk drives within the cabinet.

Ethernet networking is provided through two Intergraph Communications Processors.

Standard software

Standard software includes DEC's MicroVMS and Intergraph's core drafting and data base management packages, Interactive Graphics Design Software and Data Management and Retrieval System.

The company said that a typical system costs $280,000 and that the 252 is scheduled for November delivery.

Intergraph also sells systems based upon DEC VAX/11-785 and VAX 8650 superminicomputers.

Large computer sites favor UPS

From page 39

had minicomputers, and 25% had either superminicomputers or mainframes.

"This is the first time we have done a UPS study, so we didn't know what to expect," Young said.

He is planning to conduct another survey on power conditioning units.

"I expect that many of the sites that don't have UPS have power conditioners," Young added.

Banking industry uses UPS

Another portion of the study, which was conducted a month earlier, showed that while 19% of the banking and savings-and-loan industries used UPS, that figure fell to 16% for transportation/utilities and government categories; 10% for finance/insurance, business services, electronic data processing services and process manufacturing; and only 7% for the wholesale/retail category.

While minicomputer and mainframe sites that consume less than 50 kVA are not likely candidates for UPS ownership, the likelihood of getting UPS increases quickly as the kVA consumption rate goes up, the study showed.

For instance, only 5% of sites in the 1- to 3-kVA range plan to acquire or already have an UPS, while in the 26- to 50-kVA range, 17% of all sites report UPS activity.

Beyond the 26- to 50-kVA range, the use of UPS increases significantly. Sites in the 51- to 100-kVA range show a 25% rate of activity, while UPS show up in 33% of sites in the 101- to 500-kVA range.

At sites exceeding 500-kVA consumption, there is a nearly 50% probability that a system is either planned for installation within 12 months or is already installed.

Product Spotlight

Edited by Barbara Wierzbicki

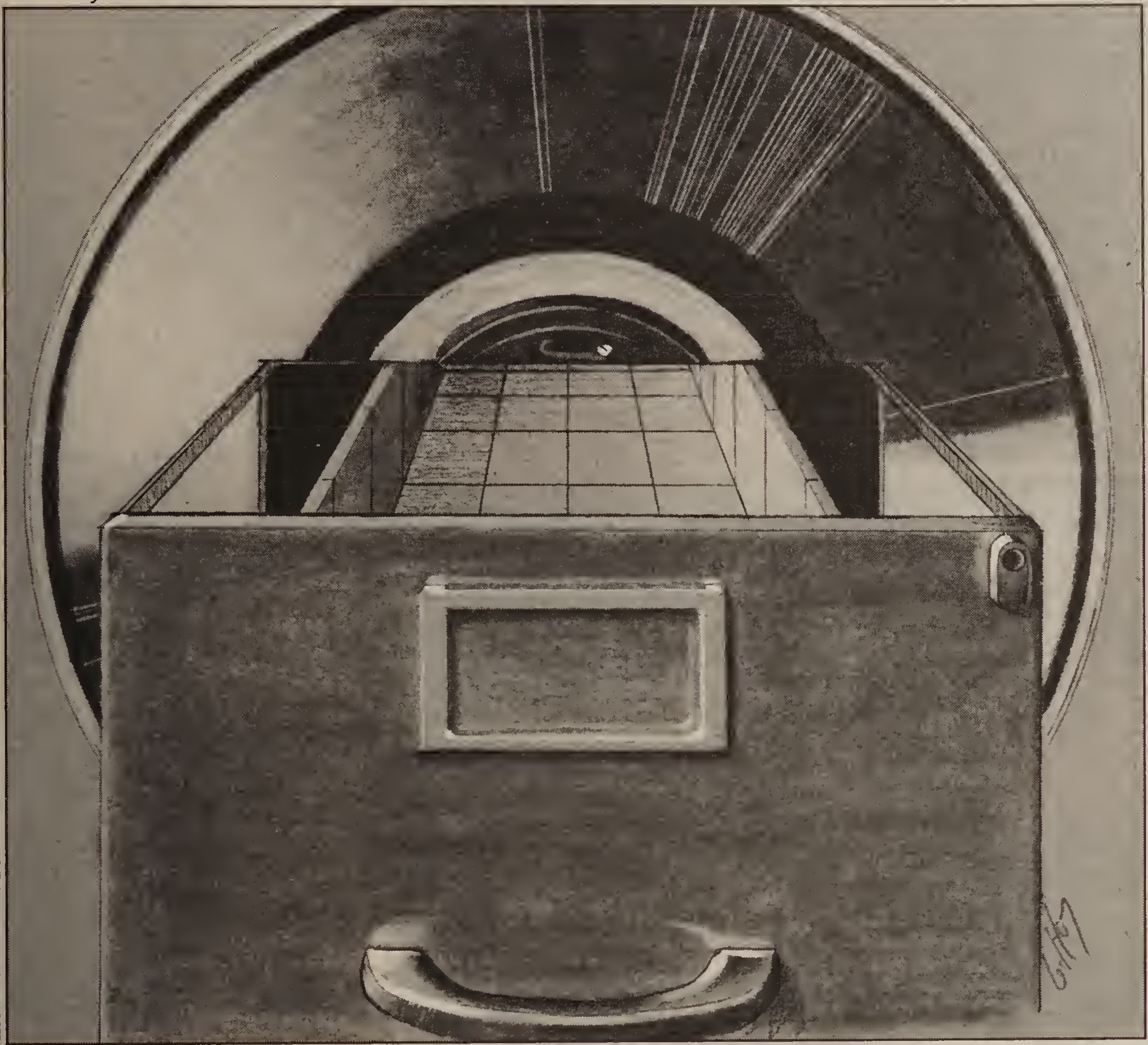

ILLUSTRATION BY BRUCE GILFOY

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Image/document processing

A risky replacement for paper-based systems

By SAMUEL P. LYLES and LILLIAN P. LYLES

For a relatively long time in the computer industry, it was tacitly understood that the fundamental units of data were numbers, alphabetical characters and a few special symbols. Stalwarts maintained this position, even when graphical characters and pictures were introduced, labeling them as information objects rather than real data. Such rigid interpretations, however, are changing as the evolving technology now forces us to regard digitized pictures, voices and so on as units of data — similar in many respects to numbers or alphabetical characters. Image and document processing is upon us.

Not only has image processing arrived, its continued development and eventual widespread use will be one of the milestones in the evolution of computer technology. Image processing will ultimately rank equally with word processing, spreadsheets and data base management systems in terms of its impact on the industry.

But regardless of the expected benefits of this rapidly progressing technology as promoted by its advocates, there is a very real need for industry professionals to exercise caution — to not be pushed by the excitement of new possibilities into spending resources on pipe dreams. DP managers must certainly stay abreast of new advances in hardware and software technology but should never lose sight of their ultimate responsibility for real-world performance.

If image processing is to be a viable information handling method, we must evolve data/image base management techniques paralleling tools available for text and numbers.

With approximately 15 commercially available systems — and many more in the wings — corporate decision makers will soon be called upon to determine the feasibility of integrating image processing into their DP environments. It is time to set down ground rules for system evaluation and selection.

What exactly is meant by image processing? The basic idea is to capture a bit representation of a picture or image that can be stored, retrieved, manipulated, printed and so on by a computer. This technology appeals strongly to paper-intensive industries — financial institutions, insurance

Continued on next page

Samuel Lyles is director of research and development at Business Records Corp., a Dallas-based firm specializing in legal records management. Lillian Lyles' career in DP spans 25 years, with extensive experience in banking and insurance operations.

Risky replacement of systems

Continued from previous page

companies, government agencies, engineering firms, banks — because it eliminates the need to use hard copies of paper documents. Moreover, image processing greatly reduces physical storage space requirements, and the nonerasable laser disk provides greater protection for valuable data.

The functional requirements of image processing should include the ability to do the following:

- Capture an image from a paper document through videoscanning.
- Compress and store the captured image on disk.
- Retrieve a desired image from the mass storage device.
- Display retrieved images on a screen.
- Edit, create and modify text.
- Print copies of images, text and data.

Capturing an image. Capturing may be accomplished by shining light on the image and measuring the reflected light at discrete intervals. For example, if a system of sensors is arranged to measure the reflected light at intervals of 1/200 inch, the image is said to have been scanned at 200 dots per inch, or 40,000 pixels.

The number of pixels included in a scanned image increases in direct proportion to the square of the scanning density (dots per inch). The appropriate scanning density for a given situation depends upon the resolution needed. Higher scanning densities are required for more detailed information.

Compressing and storing an image. This new image processing technology would not be possible without compression algorithms, techniques that allow you to shrink scanned images and store them on disk for subsequent processing.

Using compression algorithms, one side of a 12-in. laser disk can store the equivalent of 30,000 8½- by 11-in. sheets of paper — approximately the size of a four-drawer file cabinet. An office storing 1,000 images per day would require less than six inches of office shelf space per year at a cost in storage media of less than $2,000.

Assuming compression ratios of 20:1, storage requirements can range from roughly 6G byte/year (100 image/day) to 300G byte/year (5,000 image/day), depending upon application and level of activity.

Table 1 on page 48 illustrates the relationship of scanning density, image size and storage requirements. It should be apparent from the table that you need to determine the degree of resolution required with some care since the associated storage requirements increase in direct proportion to the square of the scanning density.

Document processing has also stimulated even greater interest in optical character recognition (OCR) processing. The potential for significant storage compression through OCR, offering effective reduction ratios of 200:1 and better, may very well be the difference that makes document processing feasible for certain applications.

Most "real" documents are a mixture of ASCII images and non-ASCII images like diagrams, pictures and signatures. OCR systems like Palantir Software Co.'s Compound Document Processor and the Kurzweil Computer Products, Inc. Model 4000 can convert text image data to ASCII representations, thus easily integrating word processing into the overall document processing function.

If OCR is to be incorporated into a document processing system in an effective manner, the system must be able to do the following:

- Discriminate between ASCII objects and non-ASCII objects.

> ***With approximately 15 commercially available systems, and many more in the wings, corporate decision makers will soon be called upon to determine the feasibility of integrating image processing into their DP environments.***

- Provide the user with the option of capturing ASCII objects as images and/or ASCII characters and storing non-ASCII objects like pictures and signatures as images.

Retrieving, displaying and editing an image. A captured and stored image may then be retrieved and, using the associated bit pattern, displayed on a CRT.

Standard display capabilities include multiple retrieved images on a screen, zoom, display front and back sides simultaneously, rotate the image and reverse video.

Now, imagine that you had scanned the image of the "Mona Lisa," stored it on disk and then retrieved and displayed that image in full color on your screen. In very important and fundamental ways the displayed image has already been processed, but at least two additional important types of editing are possible:

Continued on page 48

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- Spectral (frequency or color) analysis. Spectral analysis, which takes frequency or color measurements, provides a map of visible light intensities for the image as a function of the X-Y position. A technique called Fourier analysis lets you determine the contribution of each light frequency at each location. Such information allows you to go "inside" an image and modify the data in several ways, including identifying all regions of the image in which a given color is found, suppressing particular colors or ranges of colors, amplifying colors or ranges of colors and so on.

In essence, options like these let you conduct a detailed investigation of an image and then modify or edit the image's color spectrum.

- Geometric analysis. With knowledge of spectral intensity as a function of position, you may then identify and modify geometric patterns (circles, squares, ASCII characters). This capability allows you to search inside an image's bit pattern for all occurrences of the geometrical pattern according to a given word, like "Smith."

Computer analysis and editing of the spectrum and geometry of an image have been the subjects of many extensive texts, and the reader is referred to books such as *Digital Image Processing* by Gonzalez Wintz (Addison-Wesley Publishing Co.) for detailed discussions of these topics.

Printing an image. Any image processing system must allow you to print copies of images, data and text. The printing function is being increasingly done with laser printers, since these units most faithfully reproduce stored images.

If image and document processing is to become a viable information handling method, the computer industry must evolve data/image base management techniques paralleling tools now commonly available for text and numeric data.

Moreover, such systems must take every advantage of OCR, compression methods, inversion and so on in order to avoid a byte explosion that places undesirable limitations on the practical size of an image/data base.

Examining some basic parameters will help elucidate real-world limitations upon the successful implementation of any image or document processing system. To an overwhelming degree, the major practical areas of concern in evaluating these systems are rate of capture and storage.

Rate of capture. Office personnel handling claims forms at a large insurance company typically process at least 5,000 images each day. The staff requires the full-time use of four scanning machines, averaging

Table 1

IMAGE PROCESSING STORAGE REQUIREMENTS BASED ON SCANNING DENSITY AND IMAGE SIZE

Paper Size (inches)	*Scanning Density (dot/in.)*	*Storage Required (bytes)*	*Produced Storage Requirements (bytes) Based on Compression Ratios*		
			10:1	*14.3:1*	*20:1*
8½ by 11	100	116,875	11,688	8,173	5,844
	200	467,500	46,750	32,693	23,376
	300	1,051,875	105,188	73,558	52,596
	400	1,870,000	187,000	130,770	93,504
8½ by 14	100	148,750	14,875	10,402	7,438
	200	595,000	59,500	41,608	29,752
	300	1,338,750	133,875	93,619	66,942
	400	2,380,000	238,000	166,434	119,008

CW Chart

The degree of resolution needed must be determined carefully, since the associated storage requirements increase in direct proportion to the square of the scanning density.

Table 2

IMAGE PROCESSING RATES OF CAPTURE

Scanning Rates	*Small Business: 100 Images Daily*	*Medium-Size Business: 1,000 Images Daily*	*Large Business: 5,000 Images Daily*
1 sec./image	1.7 minutes	17.0 minutes	1.4 hours
10 sec./image	16.8 minutes	2.8 hours	1.8 days
20 sec./image	33.0 minutes	5.5 hours	3.5 days
30 sec./image	52.8 minutes	1.1 days	5.4 days
60 sec./image	1.7 hours	2.2 days	10.8 days

CW Chart

The time required to capture an image hinges on the rate of scanning. If document editing is needed during scanning, realistic rates of capture are between 20 and 30 sec./image.

Table 3

TIME REQUIREMENTS TO CAPTURE ARCHIVED BASES

Number of Images	*1 Sec./Image*	*20 Sec./Image*
250,000	8.68 machine-days	173.60 machine-days
1 million	34.70 machine-days	2.78 machine-years
1.25 million	43.00 machine-days	3.50 machine-years
2.5 million	86.75 machine-days	6.94 machine-years
5 million	173.50 machine-days	13.88 machine-years
12 million	1.74 machine-years	34.70 machine-years
25 million	3.48 machine-years	69.60 machine-years
768 million*	106.60 machine-years	2,132 machine-years

* An actual image base now residing on microfilm in Los Angeles.

CW Chart

scanning speeds of 20 sec./image, in order to capture the desired number of images each workday. At the low end of the spectrum, a small accounting firm needing to capture 100 images per day can do so in approximately 30 minutes with one scanning machine. Consider the requirements for offices having 100, 1,000 and 5,000 images to capture each work day (see Table 2, page 48).

You will note that the time required hinges on the rate of scanning. Equipment is available to scan either paper, microfilm or microfiche at rates of up to one image per second.

Whether this rate is achievable as practical throughput is an entirely different question, the answer to which depends almost entirely upon the nature of the application.

If any editing (key identification through OCR or manually, filtering of unwanted sections or colors and so on) is required as documents are scanned, rates between 20 and 30 seconds per document are more reasonable as a basis for determining the amount of time required.

The latter being the case, one machine should be barely adequate to maintain the pace of 1,000 images per day and at least four machines would be required for 5,000 images per day. In general, a minimal estimate would be one machine per thousand images per day.

With regard to concurrent operations, it is reasonable to assume that one must complete each day's work in one day. If the office in question generates 5,000 images to be indexed and captured each day, four capture stations working at no less than 20 sec./image will be required.

A separate yet related issue concerns the management of archived data bases. Projects to convert to image processing require plans not only for uninterrupted operations from the day of initiation forward but also for the management of historical or archived data.

Five hundred rolls of microfilm at 2,000 frames per roll — one million images — is a modest archived image base. The resources required to maintain current or date-forward operations may be considerably less than requirements to capture large archived image data bases.

For example, an office that has generated 100 images per day for 10 years now has an archived base of 250,000 images; an office generating 5,000 images per day could have an image base on the order of 12.5 million images in 10 years. The time required to capture archived bases of this size might therefore be estimated as in Table 3 on page 48.

This table should enable you to make a reasonable estimate of the minimal commitment of human and equipment resources that will be required to capture your company's historical data.

The table figures are meant to emphasize the importance of carefully evaluating the wisdom of launching into a project to convert an existing archived image data base to laser media.

In some cases, it may be that — irrespective of cost — too much time is required to capture the entire set of images. In this instance, one option is to prioritize your data and

Continued on page 54

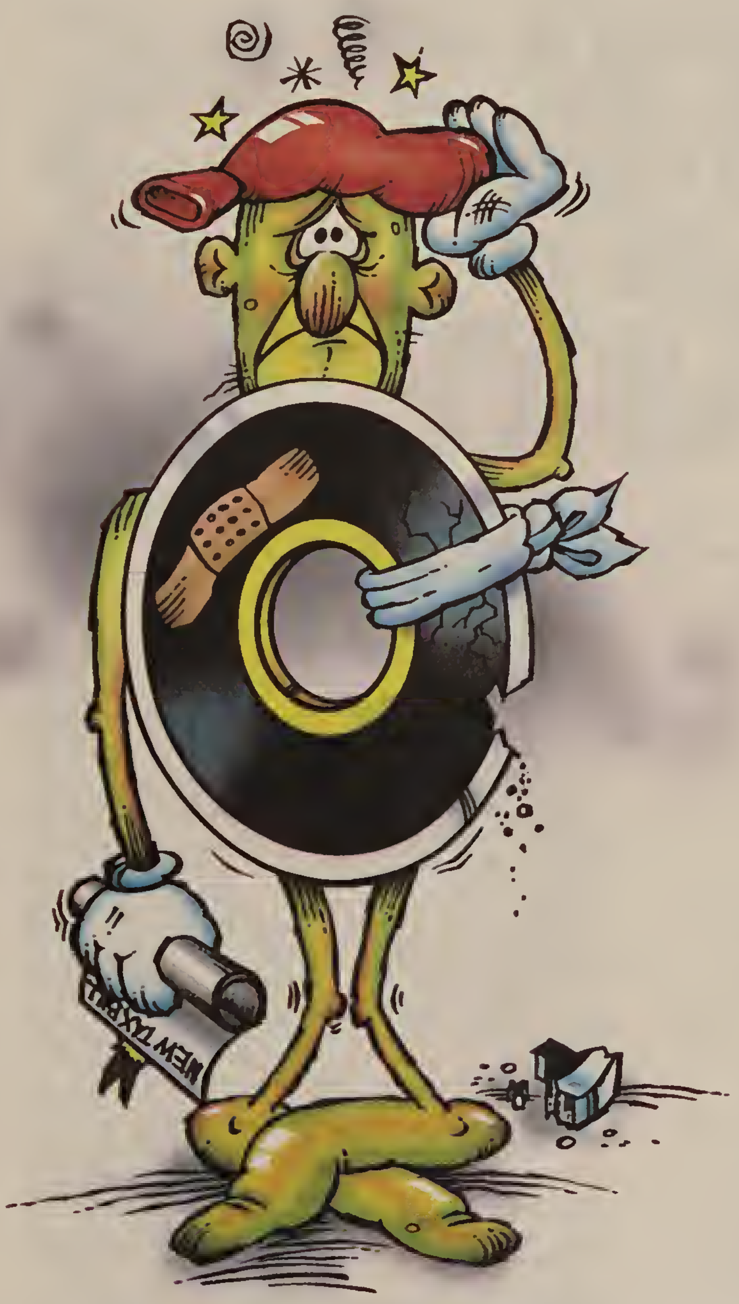
Table 4

DAILY STORAGE REQUIREMENTS BASED ON NUMBER OF IMAGES AND COMPRESSION RATIOS

Number of Images	*Compression Ratios*				
	10:1	14.3:1	20:1	30:1	200:1
100	4.57M bytes	3.27M bytes	2.28M bytes	1.52M bytes	2.28K bytes
1,000	45.65M bytes	31.93M bytes	22.83M bytes	15.22M bytes	2.28M bytes
5,000	228.28M bytes	160.00M bytes	114.14M bytes	76.10M bytes	11.40M bytes
25,000	11.41G bytes	7.99G bytes	5.71G bytes	3.80G bytes	570.70M bytes
2.5 million	114.14G bytes	79.72G bytes	57.07G bytes	38.05G bytes	5.71G bytes
12.5 million	570.07G bytes	399.00G bytes	285.35G bytes	190.25G bytes	28.55G bytes

CW Chart

An 8½- by 11-in. sheet scanned at a density of 200 dot/in. requires 456.54K bytes of storage per gray scale without data compression. At a 20-1 compression ratio, it requires 22.83K bytes of storage.



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Library, bank improve record management

By MICHAEL SULLIVAN-TRAINOR

For the Library of Congress, system speed and flexibility are fine, but the main reason image processing caught on is that it improves the quality of printed material.

On the other hand, officials at Los Angeles's Security Pacific National Bank are not concerned about the enhanced readability of their records. They are installing image processing systems hand over fist because they help control the bank's complex records system.

Each user relies on different vendors' products, but both operate image processing systems as input devices for extensive optical disk storage projects.

"We use image processing to enhance printed images, both text and photographs, such as those that appear in *Newsweek* or *Time* magazine," says Basil Manns, project engineer for the library's Optical Disk Project.

The system, made by Integrated Automation, Inc. of Alameda, Calif., reduces original printed halftone images to binary images and optimizes them through compression and other techniques. Manns' staff uses a custom algorithm to develop a pseudo halftone, which can be stored on optical disks and accessed by eight terminals.

Library staff members use the system's charge coupled device scanner to store between 1,000 and 2,000 pages of printed material daily.

Integrated Automation's system was selected by the library four years ago, because it was one of the more developed products on the market.

"Not too many people had a good grasp of image processing systems at that point in time," Manns says. "We chose the system because it provides continuous tone and allows us to define type sizes and resolution."

The only drawback with the system, according to Manns, is the preponderance of options that are operator-selectable.

"You have to have some manual commands, but it would be better if there were less. It's like any copy machine, the computer in the system needs to decide what the material is before it scans it," Manns says, "and it's up to the operator to determine the proper scanning procedures."

Security Pacific National Bank, also one of the early users of image processing, was a beta-test site for the first optical disk-based image processing system installed by Filenet Corp. of Costa Mesa, Calif., according to Robert Minnich, vice-president for the bank's image management unit.

"Filenet had a head start in terms of the other competing vendors, because its work control software and other features allow us to truncate the documents and then handle them electronically instead of doing all the paper shuffling we had been doing in the office," Minnich says.

The bank has one system operating in its international banking division, a second system being installed in personnel, and Minnich is conducting a study to justify implementing two additional systems, one in bank card operations and one in operations support, which handles individual retirement accounts.

Key to the effectiveness of the system is Workflo, Filenet's work control software, which facilitates access, storage and retrieval of the optical disk archives. The Workflo software takes over after the document has been written from the optical disk to the magnetic memory of a workstation.

It also enables operators to create new files for dispatching information to their supervisors, and it sequences investigative tasks.

Each of the division's 18 workstations contains Workflo routines to manipulate the images, with the supervisors having more advanced capabilities than the regular operators. Using a business forms page scanner, which handles 5½- to 14-in. documents, Minnich's staff can store between 2,500 and 3,000 documents a day in detailed indexes.

Other potential applications

While satisfied with the system, Minnich sees many other banking applications it could be used for in the transaction processing area, ranging from check processing to loan payments — if the scanner could operate at speeds as high as 100,000 documents per day.

"Speed is the limiting factor," he says. "The system was originally designed for records management document control, but we see a lot of other benefits for applications."

Such technological changes are beyond Filenet's capabilities, Minnich says, but the bank is reportedly negotiating with other vendors to develop compatible systems to upgrade the speed of the Filenet system.

Though they each use image processing for different reasons, managers at both the library and the bank are satisfied with the improvements in records management brought about by their image processing systems and look forward to more sophisticated, higher speed machines in the future. ■

Sullivan-Trainor is a Computerworld *senior writer.*

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★★★	7.3	The Smart Data Manager	2.00	🟨	🟨	🟩	🟩	🟩	256K	$495	✓
★★★	7.1	dBase III Plus	1.0	🟨	🟨	🟨	🟩	🟩	256K	$695	✓
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Exploring effects of optical disk imaging systems

By **NANCY S. BRYAN**

Optical disk-based imaging has received a lot of attention over the past 12 to 24 months. But how is it really affecting those pioneers who have actually implemented it, and in what kind of environment is this new technology appropriate?

Though optical disk-based systems are relatively new in production and commercial environments, users have experienced significant improvements in productivity. This article reviews the primary components of an optical disk-based imaging system and presents an overview of how the implementation of such a system has impacted a business function.

Imaging systems come in many different varieties to suit a range of applications. Some vendors provide all of the capabilities described below, and others provide only a subset.

Optical disk imaging system components. The document enters the system through the scanner. The scanner converts paper or microfilm documents directly into electronic images. The scanned images can be temporarily stored on a traditional magnetic disk, generally referred to as a magnetic cache. After the images have been scanned into the system, they are indexed. The index is a data base that contains the keys to retrieving the images in the system. This index may include the image number or name and other useful information for future retrieval.

The images, along with their associated indexes, are then transferred to an optical disk for permanent storage. The optical disk is a relatively inexpensive, high-capacity disk that is read or written by laser light. A 12-in. optical disk platter can store approximately 60,000 8½- by 11-in. images, or approximately 300 100-ft rolls of microfilm.

Many applications may require more than one optical disk to be on-line with active images. These applications may incorporate an optical disk "jukebox" or autoloader. The jukebox is a robotic mechanism that stores between 24 and 200 optical disks. It automates the retrieval of optical disks.

A jukebox with 200 12-in. optical disks has approximately the same storage capacity as 665 five-drawer file cabinets, and images can generally be accessed in fewer than 30 seconds.

Once images are loaded into the system, they are available for retrieval by an imaging workstation. The imaging workstation is a high-resolution display, generally 100 to 300 dot/in., used to view images. Software suporting the image retrieval process can have a variety of functions. These include the following:

- The ability to electronically route images to specific workstations or printers over a local-area network on demand.
- Electronic routing that allows images to be dispatched along predetermined document routes.
- The ability to hold incoming images until a predetermined packet of documents has been received (for example, all the loan application papers) and then distribute the complete set of images to the appropriate workstation.
- The ability to support multiple images such as the front and back of the same page through the use of windows.
- Zoom capability that allows the user to enlarge a portion of the screen for easier viewing.
- The ability to emulate IBM 3270 terminals, thus eliminating the need for multiple terminals.
- Editing software such as image edit, annotate and cut and paste.

> ***The optical disk imaging system is designed to minimize paper within an organization. However, there are times when producing paper output is necessary.***

The optical disk imaging system is designed to minimize paper within an organization. However, there are times when producing paper output is necessary. For this purpose, most systems include one or more high-speed laser printers. These printers can provide high-quality output in the range of 200 to 400 dot/in. resolution on a variety of paper sizes.

It is important to note that the hardware and software components can have a wide range of functions and that the selection of the appropriate vendor and system depends upon the requirements for the application.

There are two basic types of office environments that can be addressed

Bryan is a Los Angeles-based consultant in the Information Technology Group at Deloitte Haskins and Sells, a Big Eight accounting firm headquartered in New York.

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by optical disk-based imaging systems: a project environment and a procedural environment.

A project environment is one in which work is done without a predefined series of steps. Work in a project environment is somewhat unpredictable.

A law office, a research department and a records or archive center can all be considered project environments.

A procedural environment is more structured, and work is done according to a defined series of steps. Accounts payable, mortgage loan processing and retirement trust account applications can be considered procedural work.

An optical disk-based imaging system can be designed to address either a project or a procedural environment.

An image processing application — before optical disk. An image-processing application usually involves active files in a procedural environment.

One such example is a retirement trust account department of a bank or savings and loan institution. The retirement trust account department is responsible for individual retirement accounts (IRA) as well as Keogh accounts. Such a department generally provides four key services — new accounts processing, transfers, distributions and customer service.

In such an environment, paperwork for each IRA averages seven pages, and up to 30 pages for a Keogh account. In the same application, the department receives 1,500 to 5,000 pages of incoming account information daily during the normal season and up to 8,000 to 10,000 pages per day during the busy pretax season.

In an actual case, the environment that existed before the introduction of optical disk imaging had the following characteristics:

- Documenters were microfilmed immediately after they were received and, for a significant period of time, were not available as originals or on film.
- New account processing took approximately two to three days.
- Multiple terminals were required for the transfer and distribution of funds units for data entry and microfilm viewing.
- Customer service requests for account status took longer than desired.

An image processing application — after optical disk. After the implementation of an optical disk-based image processing system, the retirement trust account department is able to operate much more efficiently.

New account processing is completed the same day, as opposed to the previous two- to three-day turnaround. The work load is electronically distributed among processors. Incomplete files are held in electronic pending files, and the processor is notified when all information is received.

Transfers and funds distribution processing can be performed with one workstation instead of with the multiple terminals that were required for viewing the microfilm index, viewing images and for creating textual account transfer confirmations as well as withdrawal documents.

> ”
>
> ***When, and if, it is determined that the application is best addressed by optical disk technology, the next step is selecting the most appropriate vendor and system.***

Also, all updates to a file generated during processing no longer need to be microfilmed, but instead they are immediately stored on optical disk.

Immediate availability of initial paperwork as well as updates on optical disks significantly improve customer service responsiveness. Productivity reports can be generated for each work group so that staff members can be moved from one section to another when work loads need to be balanced.

The example organizations cost justified their optical disk system based primarily on the labor and time involved in the processing of new accounts, transfers and funds distribution.

There is much forethought and preparation involved in determining that an optical disk-based system is the most appropriate solution to an application.

Each application must individually be evaluated based on the expected costs and benefits.

When, and if, it is determined that the application is best addressed by optical disk technology, the next step is selecting the most appropriate vendor and system. As the field of optical disk systems and vendors continues to expand, the selection process becomes increasingly complex.

The key to a successful system is in selecting the medium and overall system based upon the particular needs of the application and the organization as a whole, not based on what is the newest and most talked-about technology. ■

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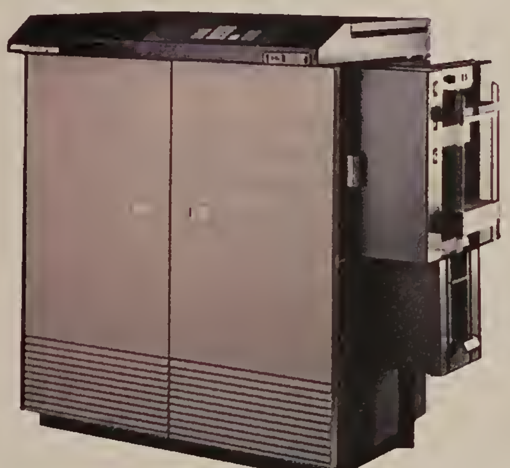

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Table 5

ANNUAL STORAGE REQUIREMENTS BASED ON NUMBER OF IMAGES AND COMPRESSION RATIOS

Number of Images to Capture Daily	Compression Ratios 10:1	14.3:1	20:1	30:1	200:1
100	1.14G bytes	798.00M bytes	570.07M bytes	380.33M bytes	57.00M bytes
1,000	11.41G bytes	7.97G bytes	5.71G bytes	3.81G bytes	570.07M bytes
5,000	57.00G bytes	39.86G bytes	28.50G bytes	19.05G bytes	2.86G bytes

CW Chart

Comparing the capture rates in Table 2 (page 48) with the storage requirements in Table 4 (page 49) permits a comparison of daily work flow rates with annual storage requirements.

Continued from page 49

capture a smaller set of critical images.

Or it may be determined that the costs of capture are simply too large to justify relative to expected benefit.

In any event, for those projects that can be cost-justified, charts such as Table 3 on page 48 help to estimate the commitment of human and equipment resources required.

Storage. As stated earlier, an 8½- by 11-in. sheet scanned at a density of 200 dot/in. will require 23,376 bytes of storage with 20:1 compression. Roughly translated, this means a single 12-in. platter can store approximately 30,000 sheets of paper. It is instructive to see what these numbers imply about storage requirements (see Table 4 page 49).

The reader is urged not to take the storage quantities too casually — 1G byte is a very large quantity, almost too large to appreciate.

We now have the capability to store incredible amounts of data on a single disk — so much data, in fact, that we must be extraordinarily careful about how it is managed for retrieval.

Comparing capture rates with the storage requirements outlined in the table located on page 49, one may compare daily work flow rates with annual storage requirements (see Table 5).

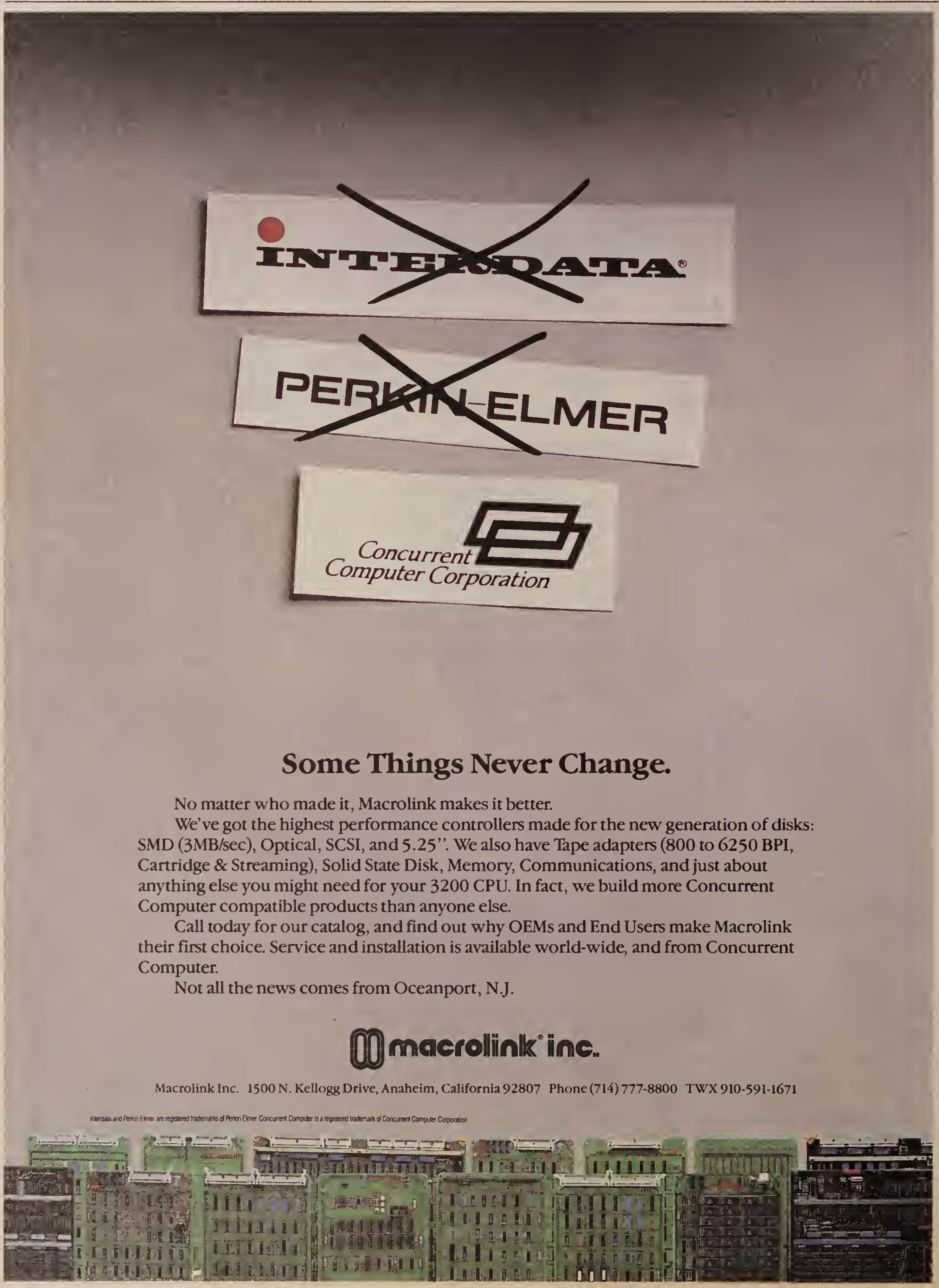
Our objective has been to clarify some fundamental parameters that govern the feasibility of implementing image processing systems. The requirement of a few tens of gigabytes of storage for even extremely large data bases of text and numeric data pales when compared with the storage requirements of even relatively small image data bases, measured in hundreds of gigabytes.

> ”
> *A few tens of gigabytes of storage for extremely large data bases of text pales when compared with the hundreds of gigabytes needed for relatively small image data bases.*

Some image data bases will, in fact, require several terabytes of storage. The only currently practical solution to meet these huge storage requirements is laser storage technology.

Even after the resolution of the storage problems takes place, one must carefully consider the rate at which an image data base can be converted from paper or microfilm to laser media.

The job of capturing an archived set of images generally must be accomplished within a specified period of time. Given that period of time, the chart calculations included in this article will help you estimate the number of scanning devices, and hence the number of people, that will be required for an image capturing project. ■



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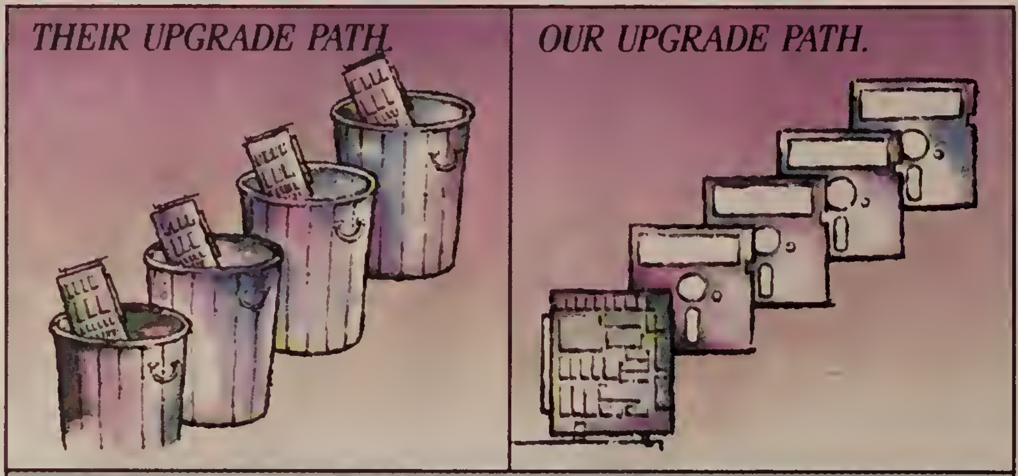
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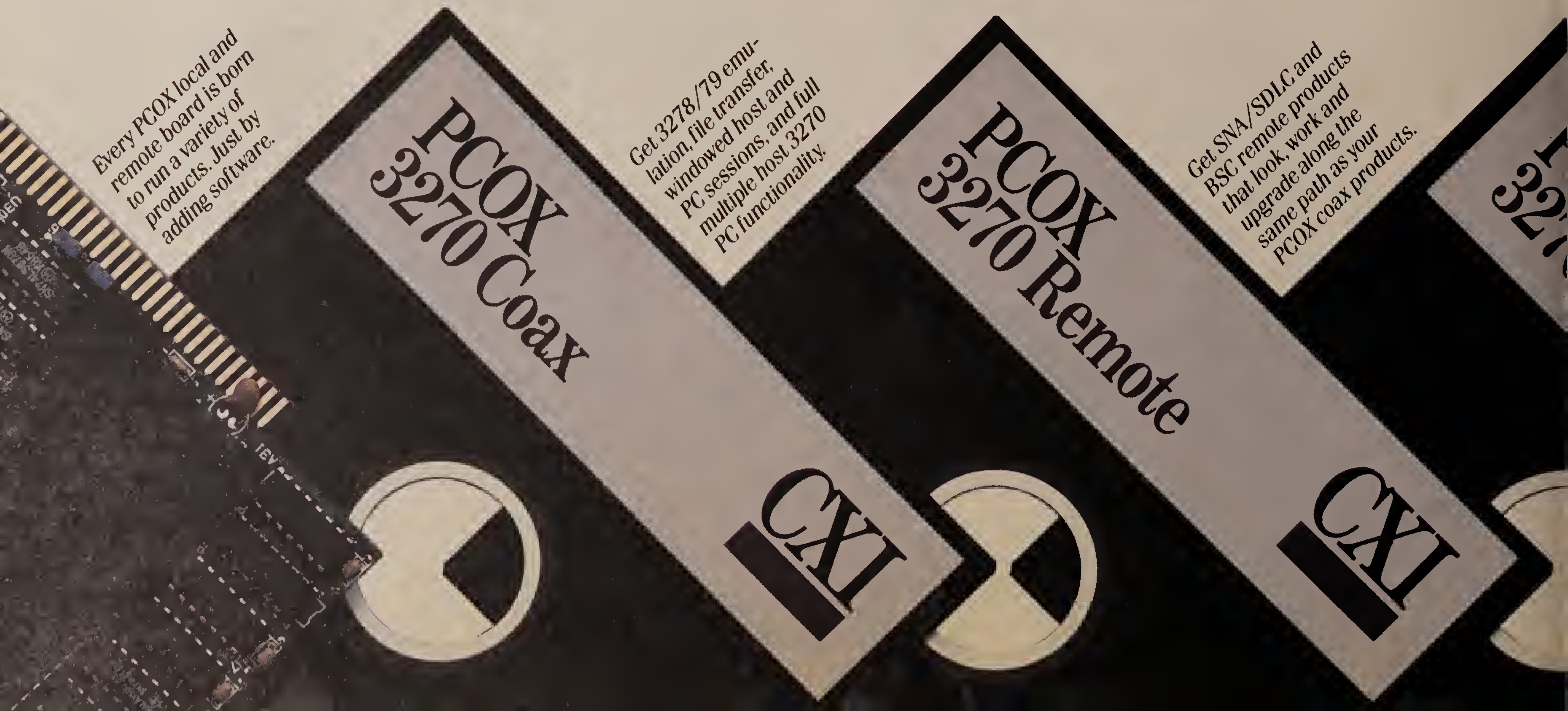

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Company/ Model/ Price	Original Image Size	Scanner Resolution	Scanning Speed	Media Capacity	Document Storage	Number of Disk Sides On-Line	Number of Document Pages Stored On-Line	Systems Access Time	CPU	Display Resolution	Type of Printer	Speed	Interfaces	Special Features
Access Corp. 1811 Losantiville Ave. Cincinnati, Ohio 45237 **Model:** *Model 50* **Price:** *Less than $40,000*	35mm, A-E size	200 dot/in.	8 to 10 sec./page	2G bytes	Auto-changer (jukebox)	Unlimited	770,000 (A-size), 192,500 (E-size)	10 to 15 sec.	Hewlett-Packard 1000 "A" 900 series	1,024 pixels by 800 pixels	Laser, electrostatic plotter	Not available	RS-232, RS-422, Ethernet, small computer systems interface	Single-drive, 20-platter unit is field upgradable to dual-drive, 16-platter
Acctex Information Systems Corp. Suite 600 131 Steuart St. San Francisco, Calif. 94105 **Model:** *Find* **Price:** *$49,900*	8½- by 11-in. to 8½- by 17-in.	200 dot/in.	8 to 12 sec./page	2,000 to 4,000 pages	Single disk drive	One to eight	Unlimited	5 to 10 sec.	Nestar, Novell or IBM local-area networks	100 dot/in.	Laser	8 to 10 page/min	IBM's Systems Network Architecture; Ethernet, RS-232	IBM Personal Computer AT with LAN; DOS file image format
Alpharel 765 Flynn Road Camarillo, Calif. 93010 **Model:** *Digital Document Transmission System* *Price: $700,000 and up*	A-E size	200, 300 dot/in.	2 to 15 sec./page	1G byte/side	Auto-changer (jukebox)	200	15 million	15 sec.	IBM 4381	200 dot/in.	Laser, microfilm	20 page/min	Ethernet, Nestar, compatible with most LANs, proprietary LAN (Alpharel 1720)	Satellite link, electronic revision of documentation, error-free transmission over LAN lines or satellite, IBM compatible, high-speed compression and expansion
Aquidneck Data Corp. 170 Enterprise Center Middletown, R.I. 02840 **Model:** *Image and Document Management System* **Price:** *$60,000 to $250,000*	Up to 40 in. by 100 ft.	100 to 400 dot/in.	1 sec./page	1,000M bytes	Optical disk drive	One (two to four drives; first quarter)	40,000 to 50,000/side	2 sec.	Motorola 68010, Intel 8286, Intel 8086	100 dot/in.	Dot matrix, thermal, laser	28 page/min	RS-232, RS-242, IBM 3270, IBM 2480	Raster image editing, raster-to-vector conversion, computer-aided design software and file interchange with any IGES-compatible CAD software
Bell & Howell Co. Image Product Dept. 6800 McCormack Road Chicago, Ill. 60645 **Model:** *Flor 1000, Flor 2000* **Price:** *$65,000 to $150,000*	A and B	200, 300, 400 dot/in.	3 sec./page	1G byte/side	Single-multiple disk drive, auto-changer (jukebox)	Up to eight	350,000	3 sec.	Proprietary	200 dot/in.	Thermal transfer, laser	6, 12, 24 page/min	Standard serial and parallel	Full image editing capability, supports up to eight full-page displays, uses standard host data base for image search
CIE Systems, Inc. 2515 McCabe Way Irvine, Calif. 92713 **Model:** *Laser Optic Filing System* **Price:** *$120,000*	8½- by 11-in.; 8½- by 17-in.	200, 400 dot/in.	12 page/min	2.6G bytes	Disk drive, auto-changer (jukebox)	32	60,000	5 to 25 sec.	Hitachi microprocessor	220 dot/in.	Laser	12 page/min	RS-232C	Facsimile capability, eight remote workstations, optical library
Distributed Image Systems Corp. Suite B 8801 Reseda Blvd. Northridge, Calif. 91324 **Model:** *Digital document image file system* **Price:** *$35,000 and up*	A-E size	200, 240, 300, 400 dot/in.	3 to 15 sec./page	115M bytes to 2.4G bytes	Single disk drive, autochanger (jukebox)	Unlimited	Unlimited	5 sec.	IBM PC AT, IBM mainframe	Four million pixels	Laser	8 to 25 page/min	Parallel, RS-422, RS-232	Can interface with any LAN, fax-compatible, compression expansion, pan and scroll up to E-size, zoom factors of 1, 2 and 4
Filenet Corp. 3530 Hyland Ave. Costa Mesa, Calif. 92626 **Model:** *Document-image processor* **Price:** *$328,000*	10- by 14-in.	200 or 400 dot/in.	12 to 17 page/min.	2.5G bytes	Auto-changer (jukebox)	3,264	85 million	15 sec. (unmounted drive), 5 sec. (mounted drive), 3.5 sec. (magnetic disk)	68,000 server-based subsystems interconnected by a LAN	Two million pixels	Laser	8 page/min	LAN	Works with company's Workflo management software, Interleaf text processor, forms generation, mainframe interface
Formative Technologies, Inc. 5001 Baum Blvd. Pittsburgh, Pa. 15213 **Model:** *First System* **Price:** *Available upon request*	A-E sizes	200 dot/in.	Less than 4 min/page (E-size)	105M bytes to 288M bytes	Single- or double-sided disk drive, mass storage devices	Not available	Not available	Not available	AM International, Sun	1,024 by 1,280 pixels	Electrostatic plotter	1 in./sec.	SNA, III from Triple-I	Software for scanning, calibrating and revising engineering drawings; integrated raster and vector editing

This chart includes information from vendors that responded to a survey conducted by the Association for Information and Image Management, based in Silver Spring, Md.

Chart compiled by Catherine Schlichte.

Product Spotlight/Image and Document Processing

	Input										Output			
Company/ Model/ Price	Original Image Size	Scanner Resolution	Scanning Speed	Media Capacity	Document Storage	Number of Disk Sides On-Line	Number of Document Pages Stored On-Line	Systems Access Time	CPU	Display Resolution	Type of Printer	Speed	Interfaces	Special Features
Infodetics Corp. 1360 S. Anahelm Blvd. Anahelm, Callf. 92805 **Model:** *Cadmac* **Price:** ***$300,000 to $15 million***	ANSI A-E and ISO A0-A4	200 to 400 dot/ in.	Variable	1G byte/ side	Single disk drive, auto-changer (jukebox)	Up to 400	20,000 to four million; up to 40 million	Less than 10 sec.	Data General, IBM or DEC	1,280 by 1,024 pixels	Electrostatic, laser, dot matrix	2 to 8 page/min	Manufacturing Automation Protocol, IEEE, Digital Data Network	Personal computer workstation, drawing management data base application, relational data base, system manages CAD files, scanned raster images, ASCII text
Integrated Automation, Inc. 1301 Harbor Bay Pkwy. Alameda, Callf. 94501 **Model:** *Docuvision* **Price:** ***$300,000 and up***	Any size document	200, 300, 400 dot/ in.	1 page/ sec.	Unlimited	Auto-changer (jukebox)	100/jukebox	Three million/ device	3 sec.	IBM, DEC, Data General	200, 300 dot/in.	Laser, electrostatic	12 to 40 copy/min	LAN, computer-aided design and manufacturing, satellite and microwave connection, RS-449, parallel	OCR, image enhancement, aperature card scanner, pan and zoom capabilities, full image editing capabilities, modular expansion, document security, relational data base for image management flexibility, raster-to-vector conversions
Integrated Software Systems, Inc. P.O. Box 27493 Denver, Colo. 80227 **Model:** *Digi-Store 500 System* **Price:** ***$18,950***	8½- by 11-in.	200 dot/ in.	30 sec./ page	200M bytes	Optical disk drive	One to 50	5,000	2 sec.	Intel 8086	1,280 by 800 pixels	Fax machine	2 page/ min	Can interface with most popular LANs	Not available
Integrated Software Systems **Model:** *Digi-Store 1000* **Price:** ***$29,950***	8½- by 11-in.	300 dot/ in.	4 to 6 page/min	400M bytes	Optical disk drive (jukebox first quarter)	One to 50	10,000	2 sec.	Intel 80286, 8086	1,280 by 1,650 pixels	Laser	6 to 8 page/min	Can interface with most popular LANs	Not available
Integrated Software Systems **Model:** *Digi-Store 2000* **Price:** ***$68,950***	11- by 17-in.	400 dot/ in.	2 sec./ page	400M bytes to 3.2G bytes	Optical disk drive	One to 50	80,000	2 sec.	Intel 80286	1,280 by1,650 pixels	Laser	2 sec./ page	Can interface with most popular LANs	Not available
Interfile Corp. 755 N. Mary Ave. Sunnyvale, Callf. 94086 **Model:** *2000 Systems* **Price:** ***$139,500***	8½- by 11-in., legal, A4	200 dot/ in.	2.5 sec./ page	1,000M byte/ side	Single disk drive	One to 16	50,000 to 800,000	2 sec.	Motorola 68010, 68000	100 to 200 dot/ in.	Laser	8 and 15 page/min	Ethernet/ SNA protocol	Interfaces to mainframe, one to 64 workstations, high-speed data base management system, banking and medical software applications
Laserdata, Inc. 10 Technology Drive Lowell, Mass. 01851 **Model:** *Laserview* **Price:** ***$43,000***	8½- by 11-in., 8½- by 14-in., 11- by 17-in.	300 dot/ in.	5 sec./ page	1.6G bytes	Optical disk drive	16	800,000	1 sec.	PC-compatible	300 by 150 dot/ in.	Laser	8 page/ min	Can interface with most LANs	MS-DOS, gray scale, simultaneous viewing and printing, decompression speed under 1 sec.
3M Co. Bldg. 220-10W 3M Center St. Paul, Minn. 55144 **Model:** *Docutron 2000* **Price:** ***$100,000 to $300,000***	11- by 17-in.	200, 400 dot/in.	3 sec./ page	3.6G bytes	Drives; autochanger (jukebox)	Eight	Six million	1 to 15 sec.	Toshiba microprocessor	200 dot/ in.	Laser	10 page/ min	Ethernet	Remote communications to groups and fax; DBMS software interfaceable to system
3M **Model:** *Docutron 9000* **Price:** ***$300,000 to $1 million***	E-size; 11- by 17-in.	200, 300 dot/in.	1 sec./ page	2.4G bytes	Auto-changer (jukebox)	64/jukebox	30 million to 40 million	0.2 to 12 sec.	DEC Microvax II	Variable	Laser	10 to 30 page/min	Ethernet	Communications switch for access to packet networks
TAB Products Co. 1400 Page Mill Road Palo Alto, Callf. 94304 **Model:** *Laser-Optic filing system* **Price:** ***$150,000***	10- by 14-in.	200, 400 dot/in.	12 document/min	2.6G bytes	Single disk drive; auto-changer (jukebox)	128	Four million with jukebox	3 to 5 sec.	Intel 16-bit microprocessor	1,728 by 2,368 pixels	Laser	10 page/ min	RS-232, supports most popular LANs	Optional remote workstations, image edit, facsimile, mouse
Talus Corp. 16780 Lark Ave. Los Gatos, Callf. 95030 **Model:** *Image Management System* **Price:** ***$39,100***	5- by 3-in. to 10-in. by 30-ft	200 dot/ in.	1 vertical in./sec.	200M bytes to 1G byte	Single disk drive	Two	4,000 (5¼-in.); 15,000 (12-in.)	5 to 15 sec.	IBM PC XT, IBM PC AT, AT&T Personal Computer 6300, IBM compatibles	1,000 by 1,000 pixels	Laser	30 sec./ page	Nestar, Ethernet	Indexing and retrieval software

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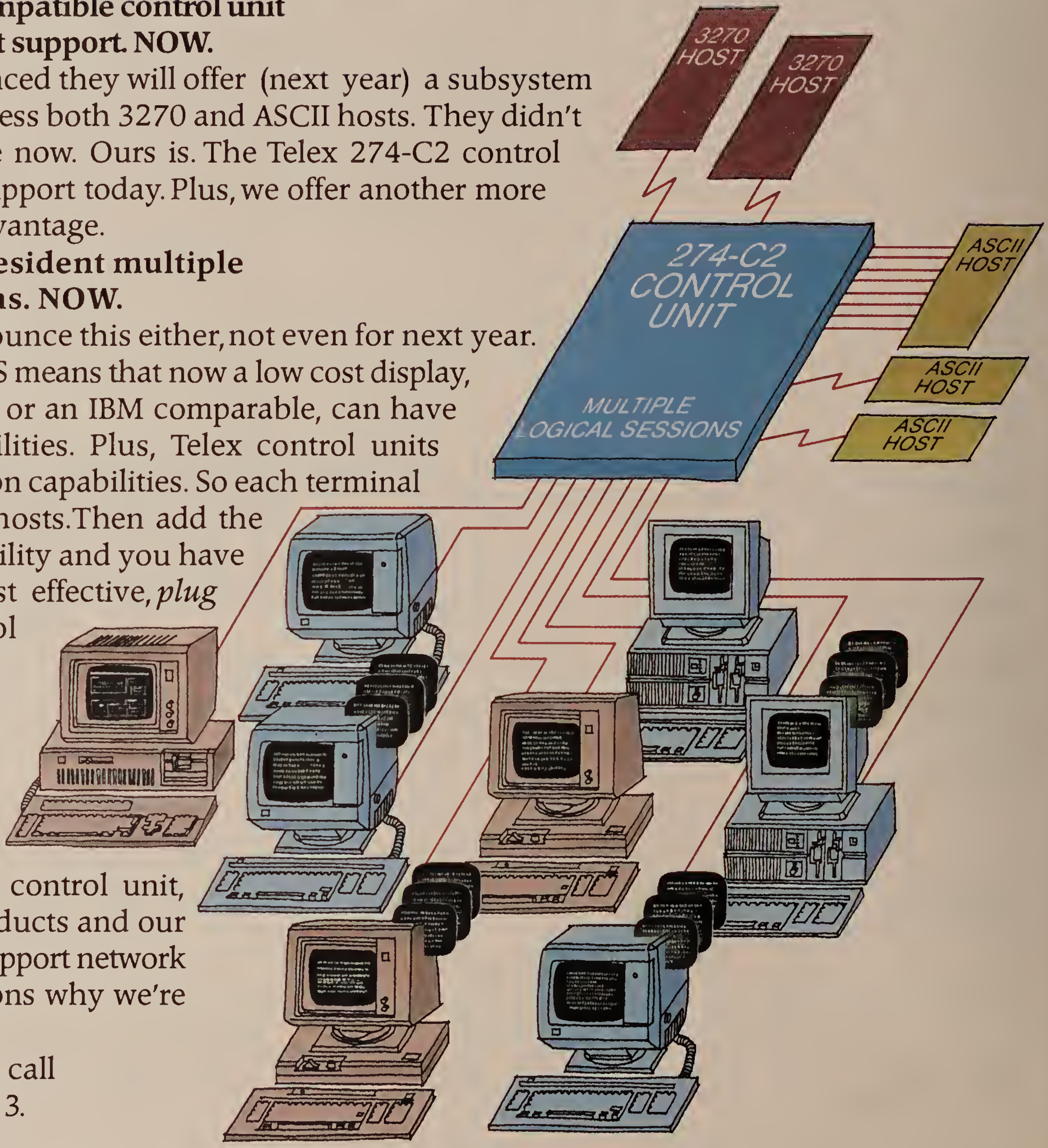

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MIS can stimulate change in corporate view of AI

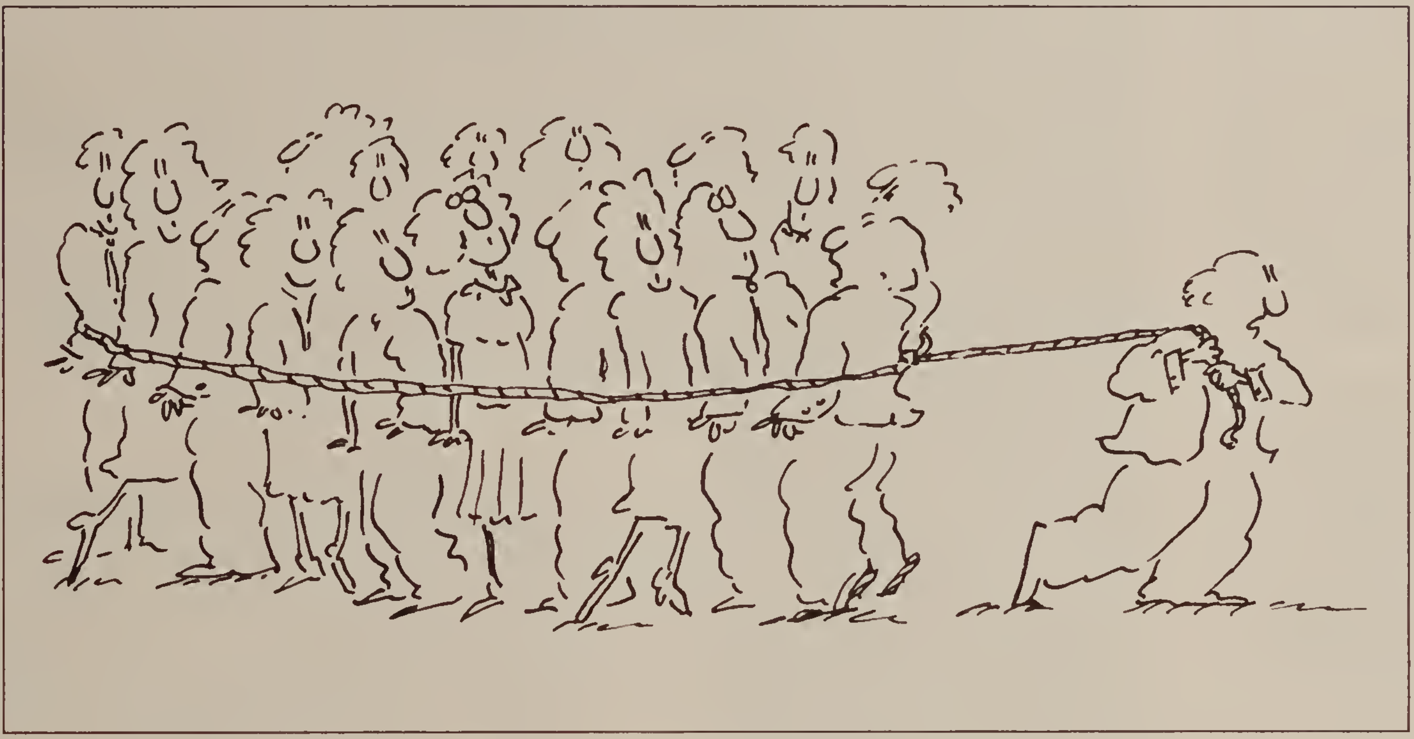

ILLUSTRATION BY CHRIS DEMAREST

Corporate budgets still snub AI development • MIS should spearhead trend toward AI technology acceptance • Curiosity breeds knowledge managers

By HENRY ERIC FIRDMAN

"Artificial Intelligence: It's Here!" So the cover of the July 9, 1984, issue of *Business Week* magazine proclaimed. Two years and dozens of similar overoptimistic media announcements later, AI is not here yet, in spite of an increasing number of successful applications and a growing consensus that AI has a tremendous long-term potential.

So what is happening? On the surface, everything is fine. AI research finds no shortage of funding: The Defense Advanced Research Projects Agency (DARPA), a research and development arm of the Pentagon, alone spends about $60 million annually on AI. Various market research firms predict that by 1990 the AI market will grow to between $1 billion and $10 billion. There are many — perhaps even too many — expert system development tools, and there is no shortage of education and training offerings. A few successful practical expert systems and other AI-based products have even been developed.

The problems become apparent when looking a little bit deeper at the same bright news. While the U.S. government (especially DARPA and the National Aeronautics and Space Administration) spends a lot of money on AI research and development, these funds go to a relatively small number of big defense contractors and start-up AI companies.

The fact is, too little AI development is funded from corporate budgets, implying that the average U.S. corporation does not believe in the commercial opportunities of AI technology or cannot afford launching an internal AI shop without a clearly visible and feasible cost-effective product in mind.

Industry of specific tools

A broad choice of AI hardware and software development tools provides further evidence that AI has been growing as an industry of specific tools and services rather than a variety of off-the-shelf commercial applications that appeal to corporations. The number of expert system development tools is so great and differences between them so elusive that prospective customers who have not done their homework have practically no chance of making the right choice.

Many customers understand that and solve the problem by ignoring it: They do not purchase AI development tools; instead they attend AI conferences to kick the tires of fancy LISP machines and knowledge representation environments presented at the exhibitions.

Most AI market forecasts are too optimistic and are based on a number of wrong assumptions. The most common one is that the AI market is demand-driven — so far, it is technology-driven.

Additionally, many market researchers overdefine AI, including with it fields that have nothing to do with artificial intelligence — like signal processing and industrial robotics — while others include machine vision and speech recognition systems as part of the market, even though

About the author

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many of these systems utilize no AI.

It comes as no surprise, then, that successful practical applications are scarce and that most of them have been developed for in-house use by high-level AI professionals such as professors at Stanford and Carnegie-Mellon universities. The success of these academicians is hard to repeat, and, not surprisingly, the commercial market for AI applications almost does not exist.

There are two promising entrants to the commercial market: Planpower, a personal financial planner from Applied Expert Systems, Inc. in Cambridge, Mass., and Financial Advisor, a corporate financial planner from Palladian Software, Inc., also in Cambridge. Both products, very impressive technically, are said to be the first expert systems for the broad commercial market; however, their broad commercial acceptance still remains to be seen.

Corporate acceptance

The picture that I have just drawn seems gloomily pessimistic. However, as one who defines a pessimist as a well-informed optimist, I see the bright side: Things can be improved if one understands the reasons for a gloomy situation.

The major underlying reason for the current situation in AI is the lack of corporate acceptance of artificial intelligence technology. I see the acceptance and subsequent incorporation of AI technology not only by Fortune 500 organizations but also by the average American company as the key to healthy AI industry growth. Certainly, this process can take various shapes and can be done at different costs, depending on company size, available financial and human resources and general commitment to high technology.

The AI technology acceptance process can best be described in the context of a triangle, the nodes of which represent three categories of people participating in it: corporate management, MIS managers and users. I avoid the term "end users," because potential users of AI technology may be very far from the "end."

The MIS manager should play a key role in the AI technology acceptance process; MIS managers meeting the challenge of an upcoming AI revolution will eventually become knowledge managers in charge of acquiring, storing, maintaining and using corporate knowledge and data.

Corporate managers' wants

My understanding of what corporate management, MIS managers and users expect from AI comes mainly from executive briefings, seminars and training courses I conducted for two years.

These meetings are one of the best possible sources of information, because they allow me to talk, both publicly and privately, with many corporate and MIS managers and users who were, perhaps for different reasons, genuinely interested in AI.

Corporate managers pursuing AI and expert systems want to be able to make the right decisions concerning the allocation of resources for AI projects.

They often say, "Now I know my guys are after a pie in the sky. I believe that we have better applications that can be developed at a lower cost." Some go even further: "Now I can make all kinds of decisions about AI," they say.

In addition, these managers also want to see whether their MIS managers can lead the AI technology acceptance process. Unfortunately, they realize the answer is

> ***The number of expert system development tools is so great and differences between them so elusive that prospective customers who have not done their homework stand practically no chance of making the right choice.***

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3163	IBM 3101 Model 881 DEC VT 52* DEC VT 100* TeleVideo 950*
3164	IBM 3101 Model 881

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Line drawing characters	24	24	24
Vertical scroll	Jump	Jump/ Smooth	Jump/ Smooth
Definable function keys	24	24	24
Windowing	No	Yes	Yes
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often no. Typically, corporate managers say, "My MIS manager has a lot of work to do. I need somebody else who is not so burdened and who has a fresh view."

Finally, corporate managers want to see whether AI can help solve their own strategic problems. Typically, even if these managers see an opportunity, they remain pessimistic because the technological problems that crop up on the way to solving their strategic problems seem to be overwhelming, and they do not have enough time or guts to face them. "Yes, it's a good opportunity — but maybe later," they say.

What users want

The users' objective is usually simpler. They have a problem in mind that they cannot solve using other approaches. They hope that AI can help.

They are typically interested in knowing more about available tools, because they are more technically oriented and because they know they are going to have to battle the company to get the hardware and software tools they need — or they think they need.

Users are often a little disappointed because the tools they like the most — for example, specialized workstations — are also the most expensive and they do not have much hope of getting them. Only a few users are happy to learn that they can get started on a basic personal-computer level.

What MIS managers want

It is much harder to present a typical MIS manager profile. I have observed at least three kinds of MIS managers, categorized according to their reasons for learning about AI.

Some want to gather enough knowledge to discuss AI fluently with corporate managers and users. These people are usually satisfied with whatever they get from the course.

Others have a specific bottleneck problem within their department that cannot be solved by conventional approaches. Typically, they behave like users, and their reaction to the course is the same, except that most of them are willing to use available hardware (especially IBM mainframes) rather than to purchase new systems.

The third group wants to understand their proper role in the artificial intelligence technology acceptance process. These people usually ask difficult questions concerning such controversial issues as the integration of expert systems into existing software, customization and maintenance of expert systems and the interrelations between experts, knowledge engineers and expert system designers.

> ***Users' objectives are usually simple. They have a problem in mind that they cannot solve using other approaches. They hope AI can help.***

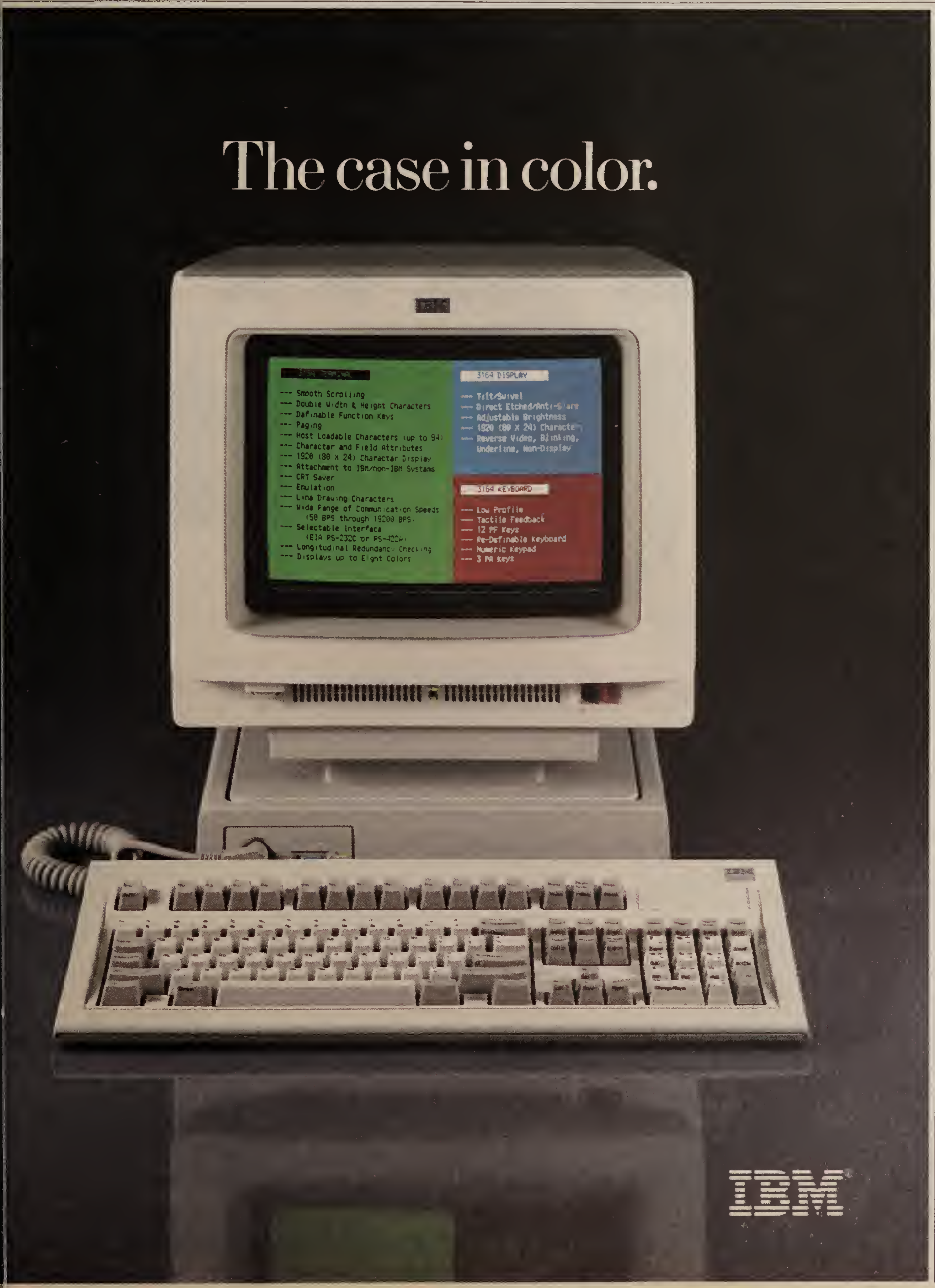
MIS managers can become a proactive rather than a reactive corporate force if they can recognize the needs of corporate managers and users early and act appropriately.

At the same time, MIS managers can relieve corporate managers of the frustration mentioned earlier and significantly improve their own image-earning reputations as corporate problem solvers at the strategic level.

Problems and solutions

The following are a few examples of strategic problems — and corresponding corporate managers' needs — for which AI technologies can be used to find solutions:

- Preservation of retiring expertise.
- Turnover reduction.
- Scheduling and planning.
- Enterprise simulation.
- Decision making.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AI: Extending technology

An artificial intelligence system comprises three major capabilities:

Knowledge acquisition. An AI system should be able to acquire new knowledge by communicating with the external world and by inferring from its own current knowledge. Inference methods can be general-purpose, like deduction, and domain-specific, like rules of thumb extracted from experts.

The acquired knowledge is stored in the medium called a knowledge base.

Goal-directed behavior. An AI system — given defined goals, adequate knowledge and a set of primitive goal achievement strategies — like actions or rules — should be able to achieve specific goals. To solve a problem, the system should build a plan as a configuration of primitive strategies and then execute this plan.

Skill acquisition. An AI system should be able to improve its performance in terms of scope, expertise and running time within the domain of its expertise, based on its knowledge and accumulated experience of goal-directed behavior. In a sense, an AI system should be able to learn from previous experience to improve its problem-solving performance.

Enhanced computing

Artificial intelligence, therefore, is not alien to conventional computer technology but rather is an extension of it.

In other words, the expression "to build AI into conventional software" is absolutely right, whereas the expression "to build AI *instead of* conventional software" is fundamentally wrong. AI is not replacing the existing technology — it is enhancing it.

Knowledge acquisition implies such constituent operations as knowledge entry; placing the knowledge chunk into the knowledge base; retrieving the knowledge chunk by querying the knowledge base; and keeping it consistent with regard to other related knowledge chunks, thus providing knowledge base integrity.

Just replace the word "knowledge" with "data," and you will see an analogy in today's data base management systems.

Goal-directed behavior is an extension of conventional programming. Generally, it includes planning and plan execution, with plans analogous to programs and their execution analogous to running the program.

Since AI systems search for solutions in order to build plans, each plan includes a number of alternative options. If an AI system has no idea which of several alternative plans is better, the plan is a result of an exhaustive search and generation of all possible ways to achieve the goal.

The greater the number of alternatives included, the more universal the plan. At the same time, the plan with more alternatives is harder — and more time-consuming — to build and execute. The exhaustive search causes a so-called "combinatorial explosion" and rapidly becomes impractical as the size of a problem grows.

Critical to AI is special knowledge, called heuristic or pragmatic knowledge, that directs plan generation to make that generation more efficient. Heuristic knowledge helps an AI system prune out the least promising options, thereby reducing planning to the choice of a few alternatives — ideally, to a choice of one.

A fundamental enhancement to conventional programming that can be provided by goal-directed behavior is plan repair, or runtime debugging of a plan, based on the results of plan execution. Obviously, conventional programs cannot be repaired in runtime.

More skills, better performance

Conventional programs cannot improve themselves. Since these programs are deterministic — having no alternative options to be reinforced or preferred — they can also hardly be improved by people, except for obvious things like loop cleanups.

On the contrary, the major function of skill acquisition in AI systems is to improve system performance in terms of the scope of problems the system is able to address, expertise measured as a percentage of the problem's particular cases solved successfully and running time required to solve the specific problem. In other words, an AI system will be able to solve a greater variety of problems and will solve each problem more effectively and efficiently as it acquires skills.

At this point, I am not aware of any commercial system that can automatically acquire skills, but the major methods for skill acquisition are fairly clear:

- Reduction of running time by eliminating or reducing the amount of search required to solve a specific problem. Reduction can be achieved through acquisition, reinforcement and adjustment of heuristic knowledge.
- Creation of new plans aimed at expanding the scope of problems solved, increasing the expertise in solving a problem or reducing the running time required to solve the problem.
- Addressing new problems based on the previous experience obtained from solving other problems, perhaps, in different problem domains. This kind of skill acquisition is called "inference by analogy."

Unfortunately, automated skill acquisition has not yet found its place in today's commercial systems. As a matter of fact, an important part of a knowledge engineer's job is to extract skills held by experts and incorporate these skills into an expert system. Expert systems that are capable of acquiring skills automatically will be able to evolve from novice through journeyman to expert. Today this capability is an exclusive privilege of human beings.

— **HENRY ERIC FIRDMAN**

Here are a few examples of users' needs and how an MIS manager can help:

Develop qualified knowledge engineers and expert system designers. People in these professions are scarce, and in-house training may be one of the most cost-effective solutions to the problem. An MIS manager can help in arranging appropriate training.

> ”
>
> ***MIS managers can become a proactive corporate force if they can recognize the needs of corporate managers and users early and act appropriately.***

Initiate AI projects. Since artificial intelligence projects are relatively expensive so far, a careful feasibility study should be conducted before any high-cost commitments are made.

An MIS manager can help in starting and conducting the feasibility study.

Obtain tools for approved AI projects. In the course of the feasibility study, cost-effective development tools have to be selected. An MIS manager can help in selecting tools based on the user's requirements and corporate policies for tool acquisition, such as hardware unification or corporate licenses on expert system development tools.

These policies are developed by the MIS department.

The AI technology acceptance process cannot be successful without well-defined and focused training. Corporate managers, MIS staff and users should go through training in AI and expert systems with different training objectives.

Corporate managers learn what can be done to incorporate AI technology in their organizations.

MIS staff members learn how to incorporate it and how to develop strategic corporate AI applications.

Users learn how to develop AI applications for their specific needs.

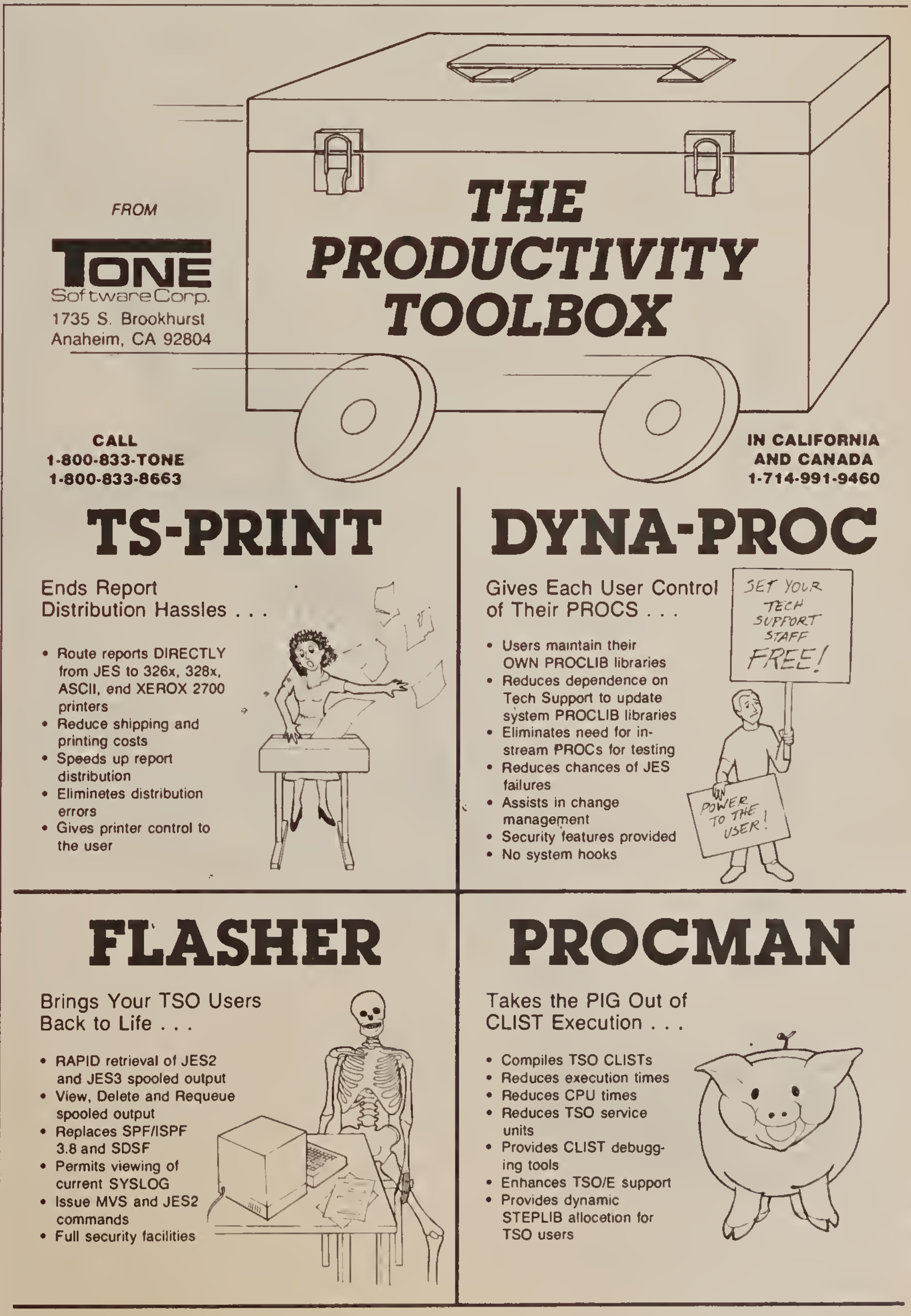
The MIS department can be a clearinghouse for comparative information about available hardware and software development tools.

The comparison should not be done solely on the basis of promotional literature. MIS people should see tools in action, perhaps even developing benchmarks and running them on different hardware and expert system development tools.

They can also get information from other companies about using these tools through information exchange and participation in users groups.

This activity is a prerequisite for formulating consistent policies concerning the use of development tools within the corporation.

The MIS staff can also collect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> ”
>
> ***The name of the game is fostering AI technology, rather than pretending that it does not exist or avoiding any proactive steps to incorporate AI technology into the corporate culture.***

information about available commercial AI applications developed both for in-house use and as commercial products for the broad market.

As the AI market expands, MIS personnel will find more AI application packages that can be purchased and customized rather than completely developed in-house. Obviously, they can disseminate this information throughout the organization.

In addition, properly staffed and equipped MIS departments should be able to develop their own application packages if the need arises, instead of trying to take over users' applications.

MIS can concentrate on strategically important applications fulfilling corporate managers' needs.

Another important responsibility of an MIS department is integrating expert systems developed by both users and the MIS department into existing conventional software.

Also important is providing communications between expert systems running on personal computers or workstations with departmental or corporate data bases and application packages running on mainframes and minicomputers.

As an MIS department develops the capabilities discussed earlier, it will inevitably function as a consulting firm within the corporation. MIS staff personnel will consult with and train users on applications and tool selection and expert system development, delivery, maintenance and support.

An MIS manager can also maintain a list of available outside consultants, with areas of expertise, to provide information or training on the issues currently beyond MIS department expertise. As time goes by, the MIS department will develop expertise in these areas, allowing it to take over the outside consultants' jobs.

Knowledge managers

The name of the game is fostering AI technology, rather than pretending that it does not exist or avoiding any proactive steps to incorporate AI technology into the corporate culture.

I believe that those MIS managers who are curious about their role in the AI acceptance process will eventually make up a new breed of MIS managers.

These managers realize that data management as a corporate function becomes just a component of a new function: knowledge management. For this reason, I call them knowledge managers.

These MIS managers also realize that AI is, in fact, the third tide of the ongoing computer revolution — after personal computers and telecommunications — that can shake their current position in the corporation. They are eager to get adjusted to this revolution, to meet its challenges and eventually to become a part of it. They are not going to be just survivors of the revolution — they will be its winners. ■

CORRECTION

A sidebar to the August 11 story on E. F. Hutton & Co. incorrectly implicated its Branch Information Processing System (BIPS) in the U.S. Department of Justice investigation of how the brokerage firm maintained its checking accounts.

The investigation focused on branch manager cash management practices, not on the operation of any automated system. BIPS was installed two years after the alleged improprieties took place and was designed to ensure such instances could not reoccur.

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MANAGEMENT

TAKING CHARGE
Alan E. Brill

System bugs as time bombs

In previous columns, I have looked at the relationship between auditors and data processing managers. In this one, I would like to suggest a program to prevent some of the problems that an auditor might find.

Specifically, let us concentrate on the portion of the review that looks at application systems. When auditors review application systems, they look for what is called an internal control. This is a concept that says computer programs should be 100% predictable. That is, they should do what they are supposed to do, not do what they are not supposed to do, and provide the user with a way of positively verifying that they are working correctly.

In my experience, few installations have this principle built into their systems development standards. That is a pity, because a system without good internal controls is a time bomb. You do not really know if it has a bug that could cause your firm a problem, such as loss of money, loss of data or embarrassment. If the system does have a bug, you do not know when it will show up, and what's worse, without control reports, you may not even know it has failed.

Clearly, applications without proven internal controls have no place in a

See **SYSTEM** page 68

Brill is director of computer security services for the New York City Department of Investigation.

MIS exec turns mediator

'Diplomat' helps when MIS trouble stirs Quaker Oats

By Stanley Gibson

CHICAGO — Gary Reitz is one information executive who is finding it takes more than technical wizardry to get to the top. For Reitz, until last year a systems development manager, diplomatic savvy is more important now.

Quaker's Reitz

In his job as client services manager for Quaker Oats Co.'s Information Services department, Reitz acts as a go-between for the company's users and MIS, a role that requires the tact of a skilled negotiator.

"You have to ask a lot of questions and be diplomatic about how you ask them," says Reitz, who managed systems development at Quaker until 10 months ago. "I can be the eyes and ears of clients and the eyes and ears of the MIS department. It's a very difficult balance. It takes a certain personality and style."

Reitz is one of seven information services officers reporting to Ronald Brzezinski, vice-president of information systems for Quaker and the man who created Reitz's position.

"He's both the clients' 'man in Havana' and the MIS department's 'man in Havana,' " Brzezinski says. "His job is to keep dialogue going and foster a good teamwork approach. It takes a very polished and mature personality not to take sides."

Reitz's position was created after Quaker broke from its mold as a Burroughs Corp.-only user and became a multivendor shop. The company had two Burroughs B7900 systems, but it is now adding an IBM 3083 Model E. The plan is to run all the machines, but to do most new development on the IBM, Reitz says. Quaker drew up a three-year plan for the

See **MIS** page 69

Getting the specs on job seekers

By Peggy Watt

ANAHEIM, Calif. — Subjecting information center job applicants to the methodical sort of standards used to review equipment might cut down on employee turnover, according to one information center manager.

Skimping on the hiring process may require filling a job again sooner than an information center director wishes, according to Nancy Carole Grenard, manager of an information center at Purdue University and leader of an interviewing workshop at the Information Center Conference and Exposition held in Anaheim recently.

Before even posting the position, managers should be sure of what they want, Grenard suggested. They should review the job description and compare it with that of similar positions. It may be time to update responsibilities.

An information center director needs specific, obvious skills and experience, but some necessary attributes are less definable, Grenard said. She urged the interviewer to try anyway.

"How important is a DP background for the particular position?" Grenard asked. "I found some very good staff members from user areas, especially in positions in which they work with users," she added.

She usually specifies educational areas and degree requirements, though experi-

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INSIDE

Calendar: Shows, conferences, exhibits/**73**

INSTANT ANALYSIS

"The client wants solutions, not a spec sheet."
— **Thersey R. Howard, executive vice-president, Datacom, Inc., Woodbury, N.J.**

Companies put computers to work to spur sales, cut costs

Study notes advances in competitive edge

By David A. Ludlum

Sales representatives for the Wrangler clothing division of Blue Bell, Inc. enter orders with a portable computer that is on-line with a corporate mainframe, preventing the booking of orders for goods that are out of stock.

Using another on-line system tied to corporate mainframes, independent insurance agents representing The Travelers Cos. can send in policy specifications and then issue policies in their offices.

At Honeywell Information Systems, Inc., a corporate system used by sales representatives profiles prospective customers, providing leads such as the names of key executives and their participation in Honeywell seminars.

These are examples of the application of information systems to sales and marketing described in a study by The Conference Board, Inc. that found growing use of computers to spur sales and cut selling costs.

Several trends underlie the development, according to the study of 160 U.S. companies, including growing competitive pressures, customer demands, rising sales costs and advances in technology.

The sales systems are found in manufacturing and service industries and in consumer and industrial markets. They are used by field sales representatives and sales and marketing managers. Along with the tasks described above, they do jobs from analyzing customers and checking the status of orders to reporting selling expenses and making sales forecasts.

In addition to issuing policies, for example, the system Travelers sells to independent agents can rate and quote prices, find prospects for one type of coverage among customers already holding another type and communicate with Travelers by electronic mail.

The Conference Board estimated less than 10% of U.S. companies have computerized their sales efforts, but "leaders in this field may be gaining a significant competitive edge," said Louis A. Wallis, the researcher who authored the study.

Of 45 companies with active sales support systems, 60% reported "very favorable" or "favorable" results, and one-third said the systems have boosted sales representatives' earnings, according to the study.

Those conclusions, however, often were based on supposition rather than hard measures, such as a predicted return on investment, or on the assumption that increased sales or profitability resulted from the systems, Wallis noted.

Generally, Wallis said, companies that were surveyed judged systems on the basis of perceptions such as more professional behavior by sales representatives or positive feedback from customers.

One of the more detailed evaluations was from Honeywell, which found that after introducing its Focus 7 sales support system, shipments and sales force productivity rose by nearly one-third and sales force attrition fell by 40%.

The company attributed much of those gains to the system, which cost $2.5 million to develop and maintain for two years. It concluded that Focus 7 would pay for itself by reducing turnover by as few as 32 sales representatives.

The Wrangler Women's and Children's Apparel Division of Blue Bell, which must fill orders determined by changing fashions during brief selling seasons, launched its system chiefly to eliminate the taking of orders for goods that, unbeknownst to the sales force, were sold out. The division said its $400,000 system increased the number of deliverable orders by 10% and generated other

See **COMPUTERS** page 68

System bugs as time bombs

From page 67

commercial or governmental environment.

If you think about your training in systems development and the training of technical staff, you will likely find that nowhere in that training do data processing specialists receive a course on accounting principles.

Given that not everyone in your organization is trained in the principles of internal control, you can set standards that will go a long way toward the development of more effective systems.

Here are some specific suggestions:

- Every application consisting of multiple programs that sequentially process data should be written in such a way that the first program counts the records that it has successfully processed and forwarded for processing by another program. Other significant numbers (dollar amounts, for example) should also be counted.

Before finishing its work, the program should post its control totals to a file. The next program should read this file and recalculate the totals to ensure that the correct numbers of records and dollars were processed. This procedure should be continued for each program in the application system.

- Every system should produce a report that indicates it processed correctly — that all internal totals have balanced, for example — or that indicates the processing volumes for single-program applications.
- One of the most overlooked areas of systems development is error processing. Too often, in the press of deadlines, there is a feeling that it does not pay to spend too much time on areas of the program that will never be used. Of course when the program blows up at 3 a.m. on a Sunday, there are no instructions for operations. Can processing continue? If so, how? Who knows? Probably nobody, if the program did not have controls built into it that report the reason for failure.
- Require full documentation of internal controls. If the controls are not documented, they are not there. Require an explanation of how the program determines that everything is normal or, if an error is detected, how it is handled by the program.
- Test the controls. Plan a specific set of tests to check their operation. These tests should be planned and conducted by someone other than the programmer. Try to make it fail. Try hard.
- Do not accept, "But it is just a personal computer program" or "It is just a one-shot report" as an excuse to ignore controls. If you accept any excuses, soon everything will fall into an excuse category.

A personal computer program can fail as easily and as disastrously as a mainframe program. And the one-shot report that fails without letting anyone know will inevitably be the one that gives the chairman of the board embarrassingly wrong data.

- Provide training in internal control principles for your staff. There are short courses available through universities and seminar companies on internal control and electronic data processing auditing principles.

The more you and your staff know about internal control, the more it will become a natural part of your systems development life cycle.

If these suggestions sound like your company's standards, congratulations. You undoubtedly have few problems come audit time. If not, why not try adapting some of these ideas to your installation.

Beyond the payback of reduced aggravation at audit time, it is simply good business.

Computers spur sales, cut costs

From page 67

additional revenue, paying for itself in one year.

The most commonly cited advantages of the sales support systems studied were providing information to the field (cited by 80% of the companies), time and territory management of the sales force (58%), cutting the time between orders and shipments (56%) and increased sales volume per sales representatives (51%).

Some of the systems were developed in-house, and some were purchased from turnkey vendors. Those installed by vendors were generally more sophisticated and tended to be up and running faster, according to Wallis.

He said that in developing the systems, companies tended to pay close attention to what users wanted. "They got a great deal of input about what the system should do. They did go out of their way to get people's opinions."

But changing users' attitudes still has been an obstacle, Wallis noted. Many sales representatives at Wrangler were skeptical of their new system, according to his study. But when they found it might increase their earnings, they were sold, the Conference Board reported.

Even then, however, the productivity of Wrangler sales force fell off, because the unfamiliarity with the system cut down on the number of sales calls they made in a day. But the division expects productivity to rebound as sales representatives get more comfortable with the computers and can work in front of customers with them, according to the study.

EXECUTIVE REPORTS

Special Editorial Features

Every issue of Computerworld presents either a Product Spotlight or Executive Report. For advertisers, it's still not too late to take advantage of the hot topics.

Financial Modeling Packages for Micros (Product Spotlight, September 15) Examines how standalone spreadsheets are fast disappearing and being replaced by integrated programs or financial modeling packages. The main article looks at what users can do after outgrowing their spreadsheets, and presents the use of a financial modeling package as one solution. Closing date August 29.

Communication Standards (Executive Report, September 22) Focuses on electronic data exchange protocol (EDI), which allows for the direct computer to computer exchange of standard business forms. This report studies the value of EDI in the transmission of purchase orders, invoices and other important documents in various industries. Also, a look at how EDI is strengthening the trade relationships between customers and suppliers. Closing date September 5.

On-line Computing (Executive Report, September 29) Explores the fact that although on-line transaction processing (OLTP) has been around since the 1960s, the market is now heating up with IBM and some BUNCH companies battling a group of young companies for the bulk of the market. This report examines on-line computing with a look at the major players, the current state of the art, and what users want. Closing date September 12.

Hardware Roundup (Product Spotlight, October 6) Covers large and medium-scale computer systems. Specifically looks at the past year's product innovations, significant revisions and enhancements, and what major players in the mainframe and supermini categories have been doing. A sidebar looks at what's going on with the BUNCH companies. Closing date September 19.

And it doesn't stop there! Important and pertinent Executive Reports and Product Spotlights topics continue through October and November.

ISSUE	TOPIC	CLOSING DATE
October 13	Hardware Roundup/Small-scale Systems (Product Spotlight)	September 26
October 20	Hardware Roundup/Microcomputers (Product Spotlight)	October 3
October 27	Decision Support Systems (Executive Report)	October 10
November 3	*1000th Issue/40th Anniversary of the Computer*	October 10
November 10	PC Graphics Hardware (Product Spotlight)	October 24
November 12	*Computerworld Focus on Microcomputing *	October 3
November 17	Systems Integrators (Executive Report)	October 31
November 24	Vertical Markets (Executive Report)	November 7

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PRODUCT SPOTLIGHTS

MIS exec turns mediator

From page 67

new IBM equipment that includes an order processing system, an accounts receivable package, distribution systems and financial accounting, including accounts payable and fixed assets.

"It requires a whole new mentality," Reitz says of the new system. A big part of his job is to see that clients are aware of the opportunities the new technology can offer and help them plan for them.

In addition to a new way of thinking, the change could bring a lot of headaches, he acknowledges.

As go-between, Reitz also runs the risk of being blamed by both sides when things do not go right. "In taking the job, he took a gamble," Brzezinski admits.

> **"**
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> ***'I have the invitation to talk to anyone within the organization I feel necessary. . . . It was a rare opportunity for personal development and the development of business skills.'***
>
> — Gary Reitz
> Quaker Oats Co.

But for Reitz, it is a gamble that may pay off in future corporate advancement.

"The reason I accepted it is because I have the ability to look into all aspects of Quaker's operations. I have the invitation to talk to anyone within the organization I feel necessary. I can learn more about the company and business plans. It was a rare opportunity for personal development and the development of business skills," he adds.

Broad exposure

Reitz says he would like to rise to chief information officer or a similarly high post and that to do so he must have broad exposure to the company.

It may become more common for managers to gain such exposure through the information systems department, he adds.

One of Reitz's duties is to help clients understand the costs of their information systems services.

With a chargeback system, a department that uses a service gets a bill from the information systems department, although no money is exchanged.

Reitz recalls one major client who was always quite vocal about the cost of computer chargebacks, claiming they were rising beyond his control every year.

In response, Reitz started itemizing chargeback bills that showed the user was spending more than necessary.

"It helps the manager understand the cost-benefit value of computer services," he says.

In another case, Reitz's communication skills were tested.

At a monthly discussion involving information systems personnel and a client group that had "always been a difficult group to work with," a heated discussion verged on direct confrontation.

But Reitz says he was able to defuse the situation by speaking to the participants individually after the meeting.

"In the past, you would have resorted to memo writing. Now, there is very little of that," Brzezinski claims. "It took six to nine months to build the confidence they had in Gary," he adds.

Reitz says he came to the job with no formal training in employee relations.

Formalizing responsibilities

"I was just given the job and told to develop some goals," he says, adding that he is still formalizing his responsibilities.

He aims to stay in the job for at least another year and, when he leaves, to offer a fully defined job for his replacement.

Although the position was created in response to the new IBM system, Reitz says it will be continued beyond the adjustment period and its focus may change.

Reitz says that whoever gets the job will have to have some of the communication skills that he possesses. "You just can't take a techie and put him in this job," he noted.

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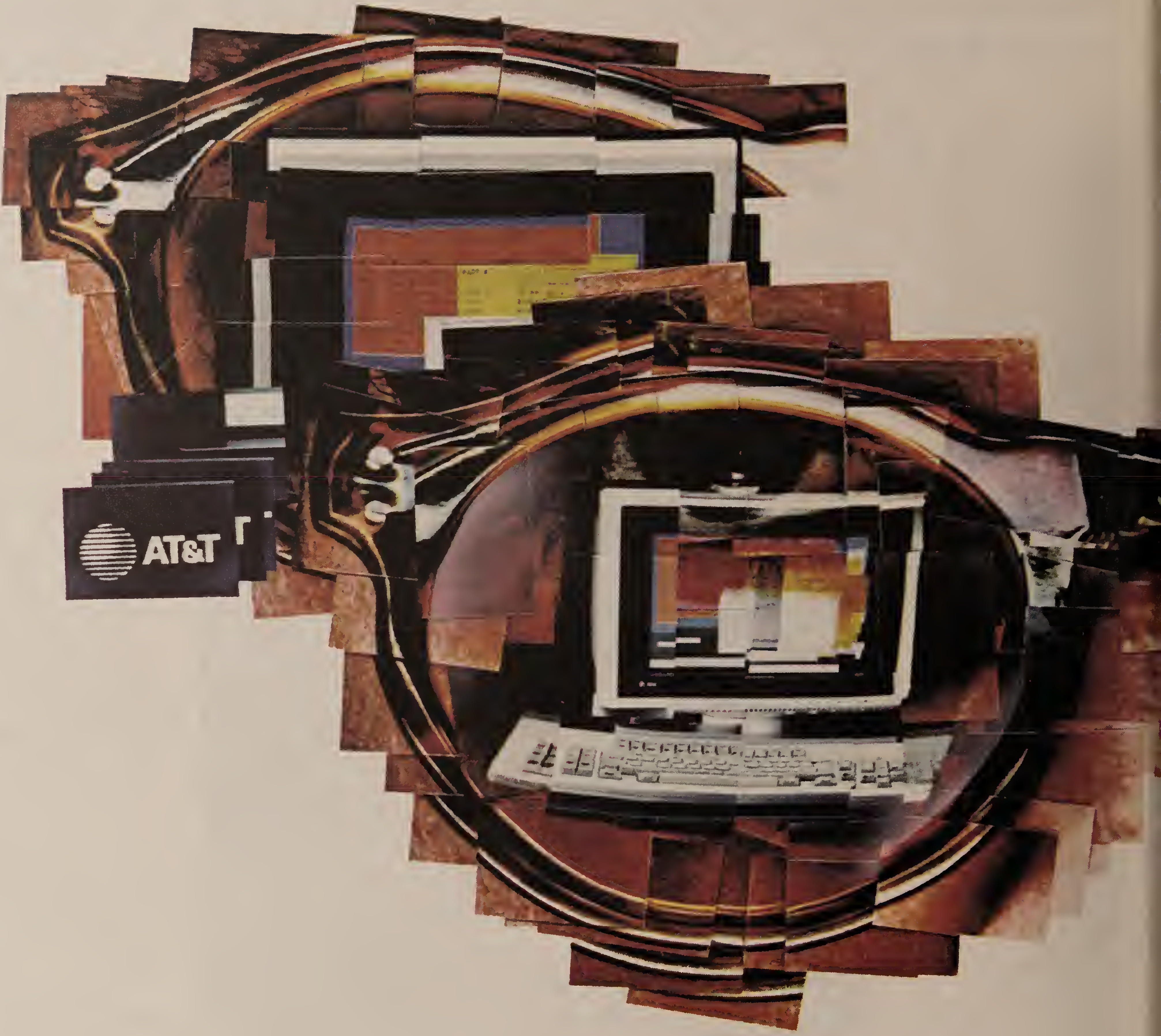

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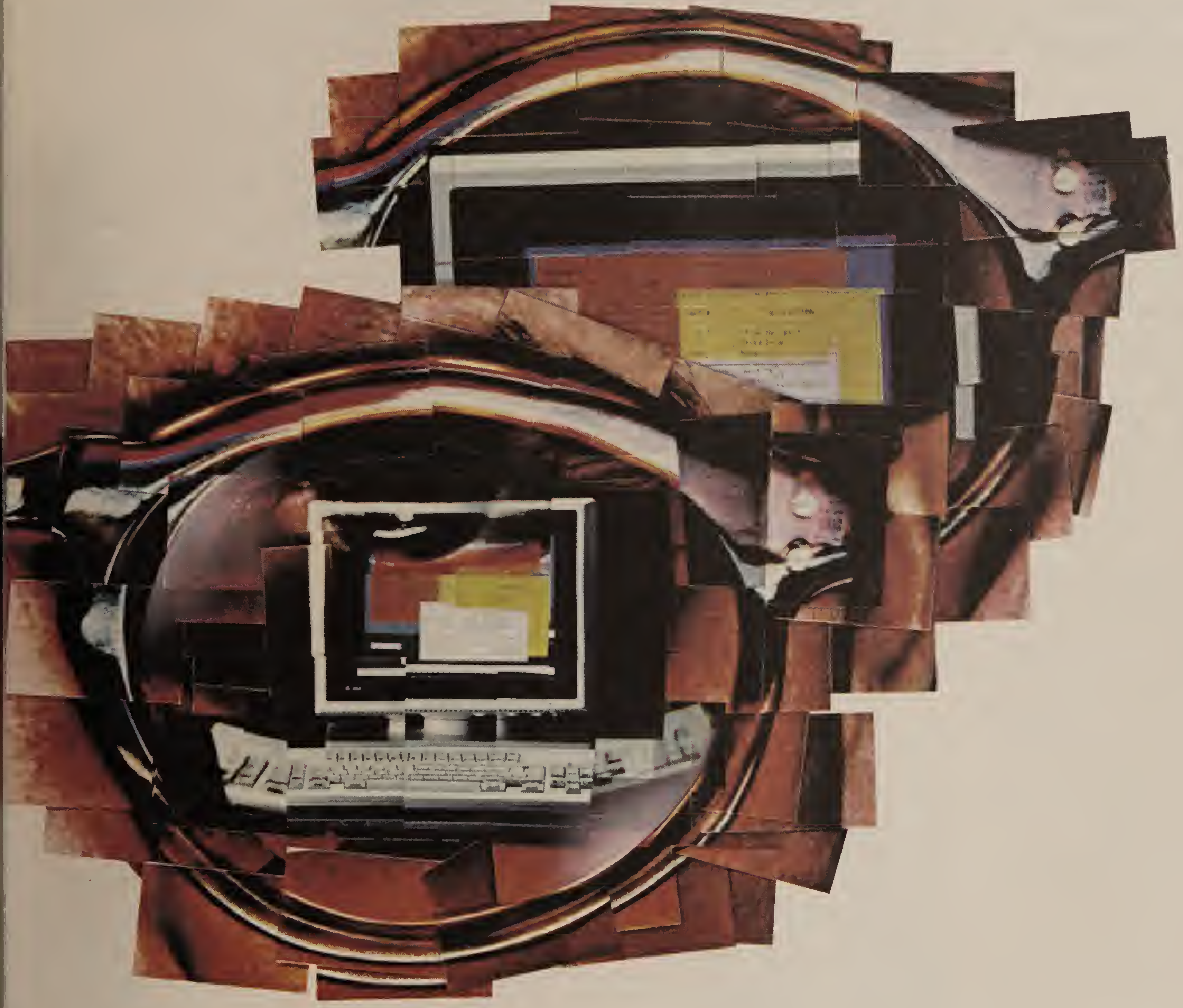

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Getting specs on job seekers

From page 67

ence alone is acceptable for some positions. Once she spells out the musts, Grenard said, she assigns numerical values to various qualifications. As the applications roll in, she rates each applicant according to the set values.

"Read the resume for content, not style," she said. "Don't judge an applicant by how much money was spent on a resume."

The key points she looks for are achievement, direction and how previous positions match or lead to the prospective one. She tries to identify a hard worker by noting those whose skills and experiences in a job go beyond what the title implies.

Grenard said to watch out for one who emphasizes education instead of experience and for too many qualifiers (such as "familiar with"), which might be signs of stretching to match the qualifications.

Whittling down applicants to interviewees is only the beginning. Grenard offered a lengthy list of questions from which she chooses 15 to 20 to ask the applicant. She said she saves a few toughies for follow-up interviews with the top contenders. As every job hopeful suspects, each question is aimed at prompting a specific, hidden or not-so-hidden message. Among the questions Grenard poses are the following:

- Can you describe for me a typical day in your present job? (A way of verifying information offered on the resume, Grenard said.)
- Describe a problem you faced in the past and how you solved it. (This is to examine the applicant's thought process.)
- What did you do differently from others in that position and why? (This tells about the applicant's willingness to conform to accepted procedures and about his initiative.)
- Describe your most satisfying or dissatisfying educational experience. (This is to provide clues about the individual's depth of experience; Grenard advised managers to be wary of one who says everything is easy.)
- What are some of the things that you found difficult to do in positions you have held? (This helps identify one unsuited to the tasks at hand. "Be very wary of anyone who considers users to be interlopers who are not to be trusted," Grenard warned.)
- What do you consider to be the best advice you could give to someone who is not computer literate but wishes to be? ("Try to find out how much sympathy they have for the novice user," Grenard advised.)
- Can you tell me a little bit about how you go about making important decisions? ("The ability to vary strategy is one of the most important in effectiveness," Grenard said.)
- What do you know about our company? (This may reveal an applicant's resourcefulness.)
- Describe the best supervisor you ever had. ("If they say 'none,' I'd be willing to bet they'd say that about you, too," Grenard said.)

Grenard suggested a one-to-one interview, calling sessions with multiple interviewers too stressful.

The interviewer must conscientiously avoid asking questions about categories banned by laws against discrimination, Grenard said. Among those are questions on race, national origin, marital and family status, age, handicaps and even some questions about residence.

"There is a catch-22 to the Equal Employment Opportunity Commission regulations," she noted. The corporate personnel department may be asked to prove it has considered and hired applicants of various races and creeds, as required by the commission, but the company is also prohibited from requesting information to categorize applicants as members of such groups. Her solution is to have the personnel department send a form asking for such information and stating that it is strictly for records to satisfy commission guidelines.

> ”
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> *One study found that 24% of all job applicants give invalid job titles, 10% misrepresent their former job responsibilities and 22% list an inaccurate salary figure.*

Look beyond the canned references often handed over at the time of the interview, Grenard added. She suggested promptly calling interviewees' former supervisors, subordinates and coworkers. "Probe a while," she said. "Get beyond the surface comments. What were these person's frustrations? Achievements? And would the supervisor rehire him or her?"

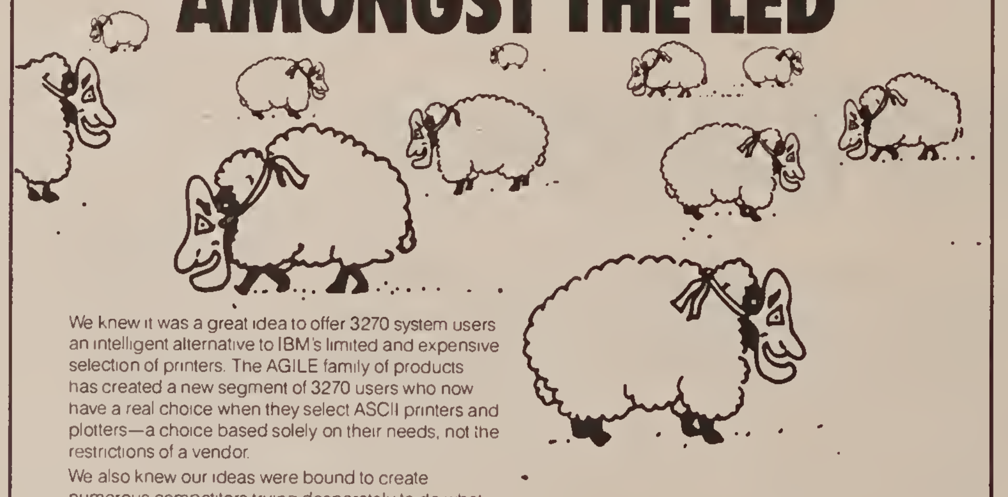
Checking with former supervisors also identifies early any exaggerated or even fraudulent qualifications the applicant may claim. Grenard cited a study that found 24% of all job applicants give invalid job titles, 10% misrepresent their former job responsibilities and 22% list an inaccurate salary figure.

The wrap-up includes reviewing the documentation, interviewing the finalists, making the choice and exending the offer. But it does not end there — Grenard said the professional interviewer extends regrets to the runners-up promptly. She also suggested saving the documentation for at least three years.

"Don't say when you turn someone down that someone else was better qualified because that's hard to back up in court," she said. "Say someone else was a better match.

"Can you still get a dud? Of course," she added. "This isn't really so different than what we go through with hardware and software evaluation, and you still sometimes end up with a product that's not a good fit in your environment."

HOW TO SPOT THE LEADER AMONGST THE LED



We knew it was a great idea to offer 3270 system users an intelligent alternative to IBM's limited and expensive selection of printers. The AGILE family of products has created a new segment of 3270 users who now have a real choice when they select ASCII printers and plotters—a choice based solely on their needs, not the restrictions of a vendor.

We also knew our ideas were bound to create numerous competitors trying desperately to do what we do

However, as a printer/plotter protocol converter, the engineering and design excellence of the AGILE 6287 is difficult to impersonate. The 6287 supports full-feature emulation of most IBM 3270 printer applications, including APL. It provides built-in diagnostics, internal power supply, and fan cooling. The 6287 is backed by a full two-year warranty, and AGILE's commitment to individual service and reliable customer support

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CONNECT ASCII PRINTERS & PLOTTERS TO IBM 3270 CONTROLLERS

Guide seeks CIM input

By Rosemary Hamilton

Guide International Corp., the association of IBM large system users, has begun recruiting computer-integrated manufacturing (CIM) professionals to help launch a CIM program for its members, according to the group's president.

"We want to bring in more people involved with CIM. We traditionally have not addressed this area," said John Nack, Guide's president. "It's one of the things that we've not done as well as we could have."

The association has received a high-level commitment from IBM to help develop a CIM program, Nack said.

The organization also has commitments from a few large manufacturing concerns that will send some of their people to Guide meetings to help with the effort, he said.

"Right now, it's the chicken-and-the-egg syndrome," Nack noted. "We don't have the program to attract CIM people, and we don't have the CIM people within Guide to develop a program."

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF OHIO
WESTERN DIVISION

UNITED STATES OF AMERICA, Plaintiff, v. THE NATIONAL CASH REGISTER COMPANY, et al., Defendants.	In Equity No. 6802 NOTICE OF MOTION TO TERMINATE FINAL DECREE Judge Walter H. Rice

TAKE NOTICE that NCR Corporation ("NCR"), formerly known as The National Cash Register Company, a defendant in this action, has filed a motion for an order terminating as to all defendants the "Final Decree" in this action, which was entered on February 1, 1916. The plaintiff, the United States of America, has consented to the entry of such an order, but has reserved the right to withdraw its consent for at least seventy (70) days after the publication of this notice.

The complaint in this action, which was filed in 1911, alleged that NCR and 28 individual defendants were engaged in a conspiracy to restrain trade, an attempt to monopolize and a successful monopolization of the cash register industry through a variety of anticompetitive practices, including corporate espionage and below-cost pricing. The Final Decree enjoins NCR and 17 individuals from, among other things:

(1) persuading a purchaser of a competitor's cash register to break his contract;

(2) espionage upon a competitor for the purpose of obtaining the names or addresses of purchasers or prospective purchasers or other information and using such information to dissuade any persons from purchasing a cash register from the competitor;

(3) inducing any employee of any competitor to disclose the business secrets of the competitor;

(4) inducing any employee of a competitor to leave the service of such competitor or inducing a dealer in competitive cash registers to cease to deal in such competitor's cash registers and to employ such employee or dealer;

(5) selling any cash register manufactured by a competitor or any cash register made to resemble a competing cash register when sold not for the purpose of earning profits therefrom but for the dominant purpose of preventing sales of such competing cash registers; or selling any cash register at a price fixed with reference not to the cost of manufacture but solely with reference to the price of said competing cash register, for the purpose of driving from business the manufacturer of the competing cash register;

(6) selling any secondhand cash register of NCR for the purpose not of realizing therefrom as much as practicable but for the dominant purpose of driving a competitor from business;

(7) having employees whose principal duty is to prevent competitors from selling cash registers or following the salesmen or dealers of a competitor for the purpose of interfering with the competitor's sales efforts or identifying its prospective customers;

(8) making any statement reflecting upon the solvency or responsibility of any competitor or upon the efficiency of any competing cash register when such statement is either a misrepresentation or is made for the mere purpose, not of directly promoting the sale of NCR cash registers, but of preventing the sale of competing cash registers;

(9) intimidating competitors or prospective investors in competitors with certain types of product comparisons or statements of purported losses suffered by the competitors in their efforts to compete with NCR;

(10) intimidating prospective purchasers of competing cash registers with suit for patent infringement;

(11) maintaining an ostensible competitor corporation that is secretly controlled by the defendants;

(12) acquiring ownership of any part of the business of any competitor in cash registers; NCR may, however, petition the Court to permit such acquisition.

Interested persons may submit comments concerning this matter by sending them to John A. Weedon, Chief, Cleveland Field Office, Antitrust Division, United States Department of Justice, 995 Celebrezze Federal Building, Cleveland, Ohio 44199 (telephone: 216-522-4070). Such comments must be received by the Division within sixty (60) days.

Copies of the complaint, Final Decree, motion papers, all comments submitted and all further papers filed with the Court will be available for inspection at the Legal Procedure Unit of the Antitrust Division, Room 7233, United States Department of Justice, Tenth Street and Pennsylvania Avenue, N.W., Washington, D.C. 20530 (telephone: 202-633-2481), and at the Office of the Clerk of the United States District Court for the Southern District of Ohio, Western Division, 200 West Second Street, Dayton, Ohio 45402. Copies of any of these materials may be obtained from the Legal Procedure Unit upon request and payment of the copying fee set by Department of Justice regulations.

CALENDAR

AUG. 31-SEPT. 6

Fourth Annual Office Automation Society International Conference. Chicago, Sept. 2-6 — Contact: OASI, Suite B, 15269 Mimosa Trail, Dumfries, Va. 22026.

Project Management Systems. Minneapolis, Sept. 3-5 — Contact: The American Institute, Carnegie Building, 55 Main St., Madison, N.J. 07940. Also being held Sept. 22-24 in Boston, Sept. 29 to Oct. 1 in Philadelphia and Oct. 22-24 in Cincinnati.

Federal Computer Conference. Washington, D.C., Sept. 3-5 — Contact: Federal Computer Conference, Box N, Wayland, Mass. 01778.

Telemarketing/West. Los Angeles, Sept. 3-5 — Contact: The Telemarketing Foundation, Inc., P.O. Box 829, Arnold, Md. 21012.

The Desktop Publishing Conference. San Francisco, Sept. 3-6 — Contact: Seybold Seminars, 6922 Wildfire Road, Malibu, Calif. 90265.

National Canadian Systems 3X Users Show. Toronto, Sept. 4-5 — Contact: The Producers, 360 Merrimack St., Lawrence, Mass. 01843.

SEPTEMBER 7-13

1986 Electronic Printer Conference. Boston, Sept. 7-10 — Contact: CAP International, Inc., One Snow Road, Marshfield, Mass. 02050.

System 1022/1032 Users Conference. Burlington, Mass., Sept. 7-10 — Contact: Software House, 1000 Massachusetts Ave., Cambridge, Mass. 02138.

Planning for Network Integration. Nashville, Sept. 7-10 — Contact: Southeastern Telecommunication Association, P.O. Box 901, Richmond, Va. 23207.

How to Design and Implement Bar Code Systems. Detroit, Sept. 8-9 — Contact: Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

Entity Modeling: Techniques and Application. Washington, D.C., Sept. 8-10 — Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

Technical Update Conference — 86. Anaheim, Calif., Sept. 8-10 — Contact: Security Pacific Audit Services, Suite 208, 11565 Laurel Canyon Blvd., San Fernando, Calif. 91340.

NCC-Telecommunications Conference. Philadelphia, Sept. 8-10 — Contact: American Federation of Information Processing Societies, 1899 Preston White Drive, Reston, Va. 22091.

Quality Assurance Institute's Seminars on Quality Data Processing. Toronto, Sept. 8-12 — Contact: QAI, 9222 Bay Point Drive, Orlando, Fla. 32819. Also being held Sept. 15-19 in Chicago.

Tutorial Week Boston '86. Cambridge, Mass., Sept. 8-12 — Contact: Director of Tutorials, IEEE Computer Society, 1730 Massachusetts Ave., Washington, D.C. 20036.

Writing Procedures, Policies and Documentation. Austin, Texas, Sept. 8-12 — Contact: Information Mapping, Inc., 275 Wyman St., Waltham, Mass. 02154.

43rd FID Conference and Congress. Montreal, Sept. 8-18 — Contact: Local Organizing Committee, FID Conference and Congress, C.P. 1144, Succursale Place Desjardins, Montreal, Que., Canada H5B 1B3.

National Capital Datapoint User Group Meeting. Arlington, Va., Sept. 9 — Contact: OSP/WHS/DCOAR, Room 1C730, The Pentagon, Washington, D.C. 20301.

Computing in the 21st Century. Bloomington, Minn., Sept. 9-10 — Contact: Charles Babbage Institute, University of Minnesota, 103 Walter Library, 117 Pleasant St. S.E., Minneapolis, Minn. 55455.

Satellite Communications Users Conference 86. Las Vegas, Sept. 9-11 — Contact: SCUC, 6530 S. Yosemite St., Englewood, Colo. 80111.

Midcon/86. Dallas, Sept. 9-11 — Contact: Midcon, 8110 Airport Blvd., Los Angeles, Calif. 90045.

1986 Intelligent Buildings Conference and Exposition. Atlanta, Sept. 9-11 — Contact: Bryson Associates, 162 Tower Place, 3340 Peachtree Road N.E., Atlanta, Ga. 30026.

Corporate Electronic Publishing Systems IV: A Conference and Show. Boston, Sept. 9-11 — Contact: Cahners Exposition Group, 999 Summer St., Stamford, Conn. 06905.

Real-Time Operating Systems: A Hands-On Workshop. San Diego, Sept. 9-12 — Contact: Integrated Computer Systems, P.O. Box 3614, 5800 Hannum Ave., Culver City, Calif. 90231. Also being held Oct. 28-31 in Boston and Nov. 11-14 in Palo Alto, Calif.

Southwest Idaho Chapter of the Data Processing Management Association's Annual Computer Show. Boise, Idaho, Sept. 10-11 — Contact: Publicity Chairman, Southwest ICDPMA, Boise State University, College of Business, 1910 University Drive, Boise, Idaho 83725.

Devlin Associates, Inc. Tenth Annual Disaster Recovery Planning Conference. Atlantic City, Sept. 10-12 — Contact: Devlin Associates, 430 Exton Commons, Exton, Pa. 19341.

Token-Ring Network & Application Program Interfaces. Palo Alto, Calif., Sept. 11-12 — Contact: Communications Solutions, Inc., 992 S. Saratoga-Sunnyvale Road, San Jose, Calif. 95129. Also being held Sept. 25-26 in New York.

Dataquest, Inc. Conference. San Diego, Sept. 11-12 — Contact: Computer Storage Industry Service, 1290 Ridder Park Drive, San Jose, Calif. 95131.

See **CALENDAR** page 74

"Computerworld tops its MIS/DP competition hands down. And it doesn't stop there."

Nora Feldman Gildea
Director of Marketing
IDEAssociates, Inc.
Billerica, MA

IDEAssociates, developer and marketer of IBM PC peripherals and a company with 500% growth during its last fiscal year, first started using Computerworld to reach a select audience (MIS/DP). Nora Feldman Gildea, Director of Marketing, soon found that Computerworld attracted much more than just MIS/DP professionals.

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A PUBLICATION OF CW COMMUNICATIONS

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Optical Storage and Retrieval. Hyannis, Mass., Sept. 11-12 — Contact: International Optical Telecommunications, 720 Main St., Hyannis, Mass. 02601.

SEPTEMBER 14-20

CADRE — An Applied Data Research Users Conference. Nashville, Sept. 14-18 — Contact: Director of Client Relations, ADR, Rt. 206 and Orchard Road, CN-8, Princeton, N.J. 08540.

Bypass: The Second Wave. New York, Sept. 16 — Contact: Conference Registrar, The Eastern Management Group, Four Century Drive, Parsippany, N.J. 07054.

Comda/Candex. Montreal, Sept. 18-19 — Contact: Candex Conference, Inc., 47 Lakeshore Road E., Mississauga, Ont., Canada L5G 4L7.

SEPTEMBER 21-27

National Retail Merchants Association's 28th Annual Retail Information Systems Conference. Anaheim, Calif., Sept. 21-24 — Contact: Director of Retail Standards and Technology, NRMA, 100 W. 31 St., New York, N.Y. 10001.

PSMJ CADD Managers Roundtable. Hyannis, Mass., Sept. 21-26 — Contact: PSMJ Roundtables, 10 Midland Ave., Newton, Mass. 02158.

Eighth Annual Lasers in Graphics/Electronic Publishing in the 80's Conference. Anaheim, Calif., Sept. 21-29 — Contact: Lasers in Graphics, Suite 1, 1855 E. Vista Way, Vista, Calif. 92084.

"C" Programming with Style and Discipline. Milwaukee, Sept. 22-24 — Contact: Center for Continuing Engineering Education, College of Engineering & Applied Science, University of Wisconsin — Milwaukee, 929 N. Sixth St., Milwaukee, Wis. 53203.

Space Tech '86. Orlando, Fla., Sept. 22-25 — Contact: Society of Manufacturing Engineers Public Relations, Box 930, One SME Drive, Dearborn, Mich. 48121.

Lasers in Automotive Manufacturing. Detroit, Sept. 23-24 — Contact: Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

International Videotex Industry Exposition and Conference. New York, Sept. 23-25 — Contact: Cahners Exposition Group, P.O. Box 3833, Cahners Plaza, 999 Summer St., Stamford, Conn. 06905.

Computer-Aided Publishing '86 Exposition and Conference. Washington, D.C., Sept. 23-25 — Contact: CAP Association, Suite 200, 90 W. Montgomery Ave., Rockville, Md. 20850.

EDI Training Session. Arlington, Va., Sept. 25-26 — Contact: TDCC, 1101 17th St. N.W., Washington, D.C. 20036.

The Fourth Annual NCR Users Eastern America Conference. Atlantic City, Sept. 25-26 — Contact: ECUO Treasurer/Convention Publicity Chairman, c/o AOR, Inc., P.O. Box 429, Willow Grove, Pa. 19090.

Robot Applications for Automotive Manufacturing. Detroit, Sept. 25-26 — Contact: Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

The Association for Women in Computing's Fifth Annual Conference. St. Louis, Sept. 26-28 — Contact: AWC Conference '86, 407 Hillmoor Drive, Silver Spring, Md. 20901.

SEPT. 28-OCT. 4

The Institute on Artificial Intelligence and Expert Systems. Chicago, Sept. 29 to Oct. 3 — Contact: Seminar Coordination Office, Suite 415, 850 Boylston St., Chestnut Hill, Mass. 02167.

Video Expo New York. New York, Sept. 29 to Oct. 4 — Contact: Knowledge Industry Publications, Inc., 701 Westchester Ave., White Plains, N.Y. 10604.

OCTOBER 5-11

Computer and Communications Security '86. New York, Oct. 7-9 — Contact: Show Manager, Cahners Exposition Group, Box 5060, 1350 E. Touhy Ave., Des Plaines, Ill. 60017.

OCTOBER 12-18

National Office Automation Conference. Washington, D.C., Oct. 14-16 — Contact: NOAC, P.O. Box N, Wayland, Mass. 01778.

OCTOBER 19-25

Infomatics '86. Toronto, Oct. 20-23 — Contact: International Information Management Congress, P.O. Box 34404, Bethesda, Md. 20817.

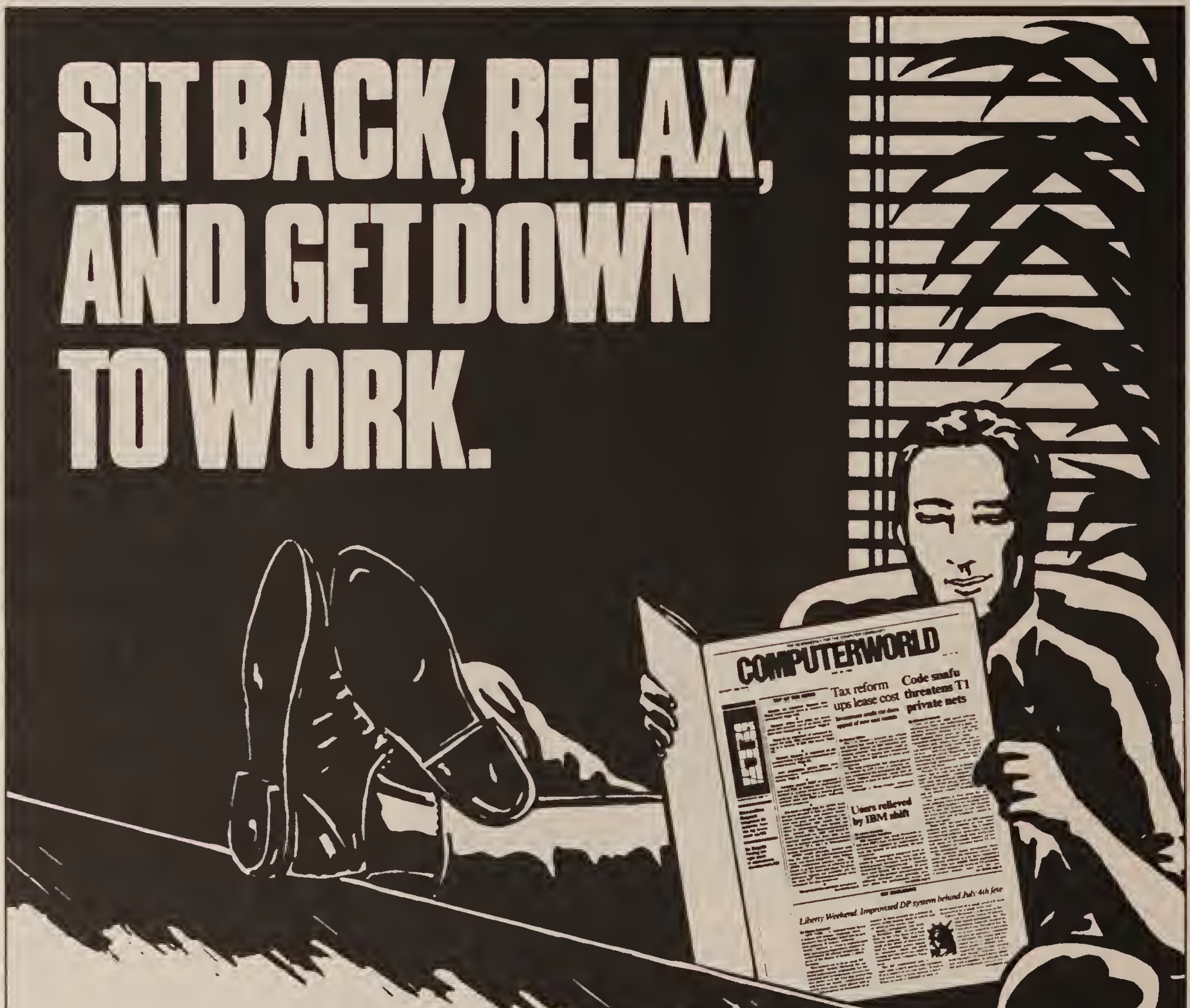
Software Configuration Management and Software Quality Assurance. Santa Maria, Calif., Oct. 22-24 — Contact: Software Certification Institute, P.O. Box 2328, Santa Maria, Calif. 93455.

Annual Human Resources Conference. New York, Oct. 23-24 — Contact: The Conference Board, Inc., P.O. Box 4026, Church Street Station, New York, N.Y. 10249.

OCT. 26-NOV. 1

IFMA '86. Chicago, Oct. 26-29 — Contact: International Facility Management Association, Suite 1410, Summit Tower, 11 Greenway Plaza, Houston, Texas 77046.

Computer Dealers and Lessors Association, Inc. Annual Meeting. Colorado Springs, Oct. 30 to Nov. 1 — Contact: CDLA, 1212 Potomac St. N.W., Washington, D.C. 20007.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Code snafu threatens T1 private nets
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NEW PRODUCTS

Tool builds graphics on Microvax II

Sherill-Lubinski of Corte Madera, Calif., has ported its Object-Oriented Graphical Modeling System to Digital Equipment Corp.'s Microvax II.

The modeling system reportedly provides more than 40 different classes of objects for constructing graphics systems. The package allow users to create, modify, animate, store, retrieve and combine objects and pictures.

According to the vendor, a parametric instancing of models or submodels has been added. This feature preserves object-class control while allowing variation of parameters across objects in the class.

Four components

The Object-Oriented Graphical Modeling System consists of four components: a graphical modeling function, which is a system function library containing an extensive set of C language functions for hierarchical graphics modeling, display and interaction; a graphical modeling language interpreter for controlling and animating models created; an object-oriented environment that is a hierarchical framework said to organize functions and provide run-time support; and a graphics editor-builder called Draw, a high-level mouse- and icon-driven graphics editor/composer.

In addition to its ability to create complex pictures, Draw maintains a graphics data base of lines, rectangles, circles and other objects that can be organized as groups, symbols or projects and then associated with various types of viewing objects, the vendor stated. Draw can be invoked to redesign and reconfigure itself for any given application.

According to the vendor, the modeling system was designed specifically to embed in existing user applications. Its subassemblies and functions reportedly integrate easily into user code with minimal intrusion.

The price for the Draw binary module is $2,500; the complete system in binary version costs $4,500. According to the vendor, source code licenses are also available.

Stratus enhances VOS

Benchmarks reveal higher throughput, less waiting

Stratus Computer, Inc. of Marlboro, Mass., has announced Release 5.1 of the company's proprietary virtual operating system (VOS) for the Stratus FT250, XA400 and XA600 continuous processing systems.

Using the company's on-line transaction processing benchmark called TP-1, XA600 systems running Release 5.1 are said to show an increase in processing throughput while maintaining an average 2-sec. response time.

Enhancements to VOS in Release 5.1 are said to be in the areas of disk I/O management, such as increased disk cache manager capacity, which allows more disk I/O operation/sec.; improved locking algorithms, which speed cache management and cut application waiting time for locked files or records; increased disk cache size up to 60M bytes; and more available buffer resource space, which allows VOS to manage more processes, open files and attached devices.

VOS is said to be a virtual memory system designed for multiprogramming, multiple processors and networking in a fault-tolerant environment. VOS allocates system resources such as memory, CPUs and peripherals to each user as needed.

VOS Release 5.1 will be distributed Sept. 1 to Stratus customers with maintenance agreements at no cost, according to a company spokesman.

With Release 5.1, the company announced it is also providing results through the use of an on-line transaction processing benchmark called ET-1. ET-1 reportedly simulates a simple debit/credit transaction with minimal processing. A single-module XA600 system running Release 5.1 under ET-1 demonstrated 15 transaction/sec., the vendor stated.

Referee tends RAM programs

Referee, a utility program said to manage random-access memory (RAM)-resident software, has been introduced by Persoft, Inc. of Madison, Wis.

Referee is said to aid in preventing malfunctions and data loss that can occur when RAM-resident programs, such as desktop organizers, spelling checkers and keyboard enhancers compete with each other and with application programs for the computer's internal resources.

With Referee, users are reportedly able to activate or deactivate loaded memory-resident programs, either automatically or manually, to avoid combining programs that may vie for similar resources. Referee costs $69.95.

Referee also allows users to team up only those RAM-resident programs that are appropriate with a particular appplication program by establishing in advance which memory-resident programs should be activated with a particular program.

A user can also manually alter, either at the DOS prompt or with the memory-resident option of Referee, which RAM-resident programs are active. With this option, a user running an integrated program such as Lotus Development Corp.'s Symphony can manually activate a RAM-resident printing utility program in the spreadsheet portion of the program and have only a desktop organizer active in other portions of the program.

Referee can also unload RAM-resident programs from memory even if they do not have a specific unload feature. It shows the user which programs are active or inactive, as well as the amount of memory each program is using.

Referee can either be implemented as a stand-alone program or as a memory-resident program. In either case, a memory core must be loaded.

Referee runs under Version 2.0 or later of the IBM PC-DOS operating system. The central portion of the program is said to require about 25K bytes of memory and the additional memory-resident portion of the program requires another 12K bytes for nongraphics displays and 24K bytes for graphics displays.

INSIDE

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& Peripherals/**80**

PCs develop object-based images with Smalltalk language

Digitalk, Inc. of Los Angeles has released Smalltalk/V, an implementation of the company's object-oriented programming language, said to transform an IBM Personal Computer or compatible into a graphical programming environment similar to that found on dedicated artificial intelligence workstations. Smalltalk/V costs $99.

Smalltalk/V reportedly features bit-mapped graphics, windows, mouse support, a built-in Prolog compiler, object-swapping virtual memory and a source-level debugger.

According to the vendor, the Smalltalk/V environment is modeless, allowing users access to all features at all times. Multiple windows can be open on the screen at one time, each with a different activity, giving programmers the ability to rapidly construct, test, debug and re-execute code without the need for time-consuming compile and link sessions.

Graphics capabilities

Smalltalk/V's graphics abilities include bit and forms editor for the creation of graphic icons and fonts, as well as Turtle graphics, which are said to simplify the manipulation and animation of graphic objects.

Each graphic object can be linked to other graphic objects through the Smalltalk message-passing paradigm, making possible the construction of complex simulations in which objects on the screen can modify each other's behavior. Smalltalk's built-in Prolog compiler is said to introduce users to logic programming and permits the integration of object-based and rule-based programming techniques.

According to Digitalk, the program's sophisticated source-level debugger greatly speeds program development. It includes the ability to examine and change local variables and then resume the program or restart the execution of a specific method. All Smalltalk source code is included, except compiler, with browser windows said to promote easy access and modification.

Other features of Smalltalk/V include an automatic change log that records every modification of the environment and permits its reconstruction in case of error; a directory-and-file browser system that gives a graphic representation of the organization of IBM PC-DOS files and directories, enabling them to be easily modified and organized; access to other languages and DOS functions; and a DOS command shell.

An optional communications interface permits communication with AT&T Unix System V and University of California at Berkley Unix 4.2 and other systems via RS-232 for $49.

Smalltalk/V is not copy protected and requires 512K bytes of random-access memory on the IBM PC, Personal Computer AT and compatibles. It also requires a Microsoft Corp. or compatible mouse and IBM Enhanced Graphics Adapter, Hercules Computer Technology or AT&T graphics controller. Digitalk's original, nongraphic Smalltalk implementation, Methods, has been reduced in price from $250 to $79.

NEC'S PINWRITER P5XL HAS

Our Pinwriter® P5XL printer has changed forever the way people look at dot matrix printing.

It's the first and only dot matrix that can use a letter-quality multistrike film ribbon—the same ribbon used in typewriters and letter-quality printers, such as our Spinwriter.® Which means for the first time in computer history you can produce important letters and documents with crisp, black, true letter-quality printing without sacrificing speed or graphics capability.

Fast, black letter-quality printing will be the primary reason many people will buy a P5XL printer. But there are plenty of other good reasons. In fact, it's the most versatile printer ever created for personal computers.

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C&C Computers and Communications

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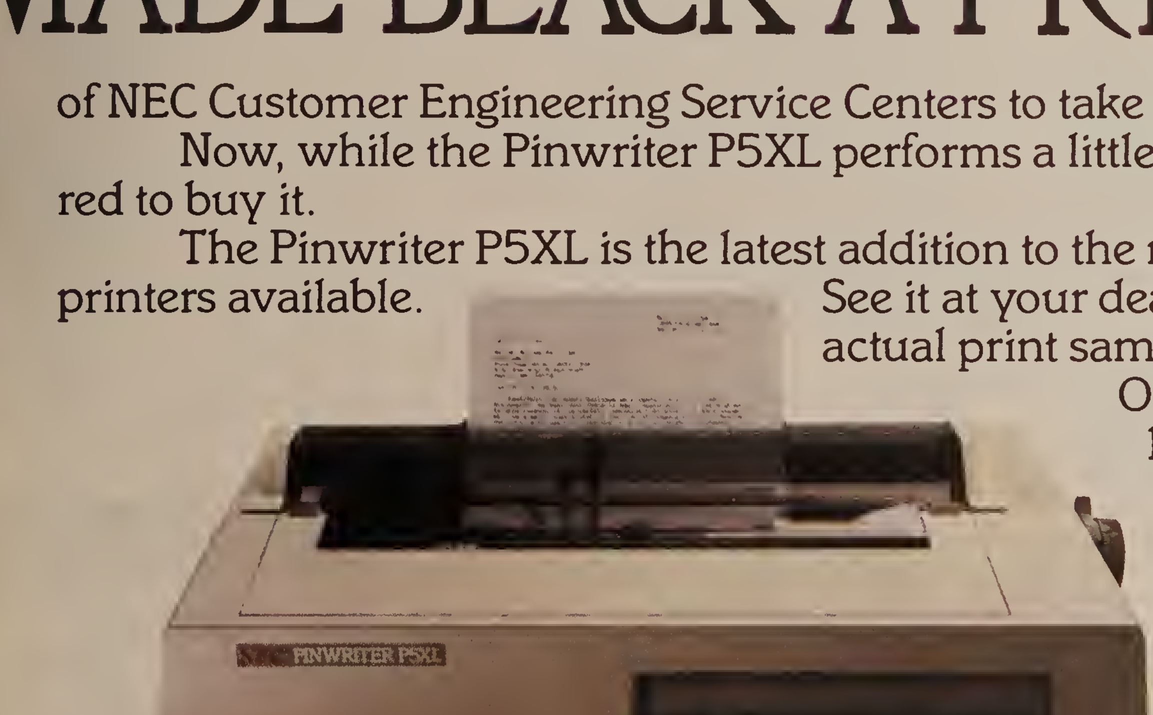
The Pinwriter P5XL is the latest addition to the most advanced and extensive family of 24-pin printers available.



See it at your dealer or for an information package that includes actual print samples, call 1-800-343-4418 (in MA 617-264-8635).

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NEW PRODUCTS/SOFTWARE & SERVICES

SOFTWARE & SERVICES

Systems software

C.D.S. Computer Corp. has announced its **User Security Authorization System** to provide an added level of security for users of Digital Equipment Corp.'s VAX computers with the VMS operating environment.

Features of the User Security Authorization System include issuance of an additional password, elimination of the VMS prompt and the ability to restrict users to a specific terminal.

For dial-up users, the system reportedly provides an optional disconnect and dial-back to predetermined numbers and verification of answerbacks from terminals or personal computer-based emulators.

The User Security Authorization System costs $4,500.

C.D.S. Computer, Suite 205, 21243 Ventura Blvd., Woodland Hills, Calif. 91364.

Applications packages

Britz Publishing, Inc. has announced **Art System Release 2.0** of its accounts receivable software for the IBM System/34 and System/36 family of computers.

Art System Release 2.0 is said to be an open item, batch method, accounts receivable system that includes such functions as data entry, invoice printing, accounts receivable ledger, aging reports and transaction history.

Art System Release 2.0 has a one-time charge of $99.

Britz Publishing, 1814 Capital Towers, Jackson, Miss. 39201.

■

Daly & Wolcott, Inc. has introduced the **Shipped Order History** system, an enhancement of its Mapics II Order Entry & Invoicing for the IBM System/38.

The Shipped Order History system reportedly saves a shipment history for each order and sequences it by customer and item, a feature not available to Mapics II users. The package also features alpha-search to help users find customer numbers and provides the following inquiry screens: open order summary, open orders by item, customer open order detail and shipment history.

The Shipped Order History system costs $1,200 on the System/38.

Daly & Wolcott, P.O. Box 1509, East Greenwich, R.I. 02818.

■

Target Systems Corp. has announced its **Target-Sales** software for all Digital Equipment Corp. VAX VMS computers.

Target-Sales reportedly can be used to facilitate account management, lead tracking and follow-up scheduling.

According to the vendor, account profiles, call sheets, letters, labels, aged reports and Rolodex cards can be created based on several demographic selections.

Unlimited ongoing dialogue can be captured with Target-Sales, allowing large sales departments to maintain a close relationship with current customers.

Target-Sales is priced at $995.

Target Systems, 33 Boston Post Road W., Marlboro, Mass. 01752.

Utilities

Corinthian Software Sales, Inc. has released **Sourceplus**, a VM source library system.

Sourceplus reportedly controls source, job control language and other data, provides security and flexibility and condenses direct-access storage device (DASD) by 70%. According to the vendor, Sourceplus also handles standard and user-defined "Includes" and operates with DOS and/or OS guests or in pure VM.

Sourceplus is priced at $4,500.

Corinthian Software Sales, Suite C-250, 3260 Powers Ferry Road, Marietta, Ga. 30067.

MICROS

Software applications packages

Southern Computer Systems, Inc. has released **Keyentry III Plus**, an extension to its Keyentry III data entry system for the IBM Personal Computer.

Keyentry III Plus provides the following additions to Keyentry III: a data entry language that can be com-

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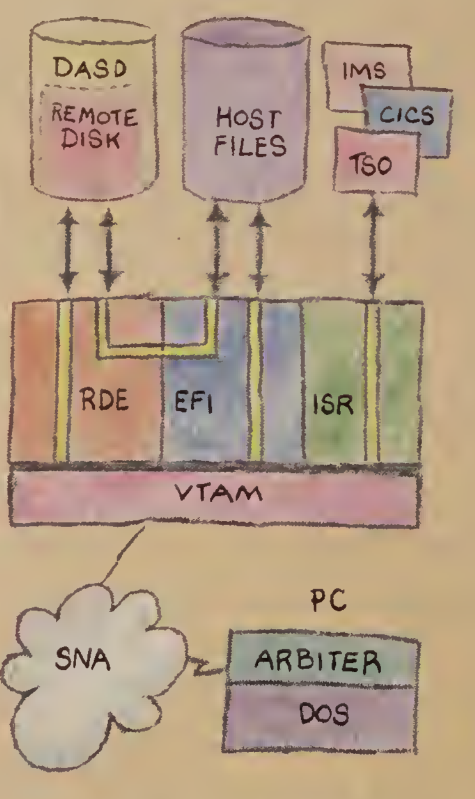

Arbiter has three components. The Remote Disk Environment (RDE) provides a seamless interface to remote disks on the host, which may be accessed by PC users or host application programs. The External File Interface (EFI) transfers data to and from files on the host and the remote disks. The Interactive Session Relay (ISR) allows "power users" to connect a PC to another mainframe subsystem–for example, TSO or CICS–without disconnecting from Arbiter.

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NEW PRODUCTS/MICROCOMPUTERS

bined with Keyentry III's parameter-based job definitions to provide almost unlimited entry, processing and verification flexibility; and the screen painter for Keyentry III applications that require custom screens.

Keyentry III Plus carries a price of $895.

Southern Computer Systems, 2732 Seventh Ave. S., Birmingham, Ala. 35233.

Software enhancements

Software Studios, Inc. has enhanced its **PC-Desk** personal productivity program for IBM Personal Computers and compatibles.

The new version features a to-do list; a client billing log, telephone log and expense log; a telephone directory; a word processor featuring automatic right margin justification, boldface, underlining and color support; and an installation program.

Other new features include printed documentation.

PC-Desk costs $125.

Software Studios, Suite 104, 8516 Sugarbush, Annandale, Va. 22003.

■

Excalibur Sources, Inc. has released **Version 2.0** of its **Exsell** automated sales prospecting system.

Exsell Version 2.0 includes features such as call activity reporting, simultaneous updating of multiple prospect records, advanced search capabilites using key words or phrases, search-and-phone functions and a counter that shows how many prospects meet the same criteria.

The system works on IBM Personal Computers or compatibles with 128K bytes of random-access memory, two disk drives or a hard disk and a modem for autodialing.

Exsell Version 2.0 costs $395.

Excalibur Sources, P.O. Box 467220, Atlanta, Ga. 30346.

Communications

Elgar Corp. has introduced **Failsafe LAN**, a software program said to allow communication between local-area network (LAN) systems and Elgar's standby battery power systems.

According to the vendor, in the event of a power failure, Failsafe LAN is automatically activated to close application programs, secure system files, initialize printers and execute external processes such as parking hard disks. Failsafe LAN is random-access memory-resident.

Failsafe LAN is bundled with Elgar's battery backup system and ranges in price from $765 to $1,295.

Elgar, 9250 Brown Deer Road, San Diego, Calif. 92121.

■

Computer Peripherals, Inc. has introduced the **Little Dictator**, an enhancement board said to allow IBM Personal Computers and compatibles to be controlled by voice commands.

According to the vendor, the board can be programmed to respond to as many as 500 commands and to recognize up to 64 voice patterns. The user can store menus, submenus and menu extensions of up to 50 commands per menu.

The Little Dictator is priced at $599, including a microphone.

Computer Peripherals, 2635 Lavery Court, Newbury Park, Calif. 91320.

Printers/Plotters/Peripherals

Advanced Matrix Technology has enhanced its all-in-one line of Office Printers and introduced a **triple-bin cut-sheet feeder** for stationery, forms and envelopes.

The enhancement allows first-line printing, permitting return addresses to be printed in the upper left corner of envelopes and on the first line of forms or other formatted documents.

The sheet feeder's three bins are said to accommodate up to 220 sheets of 20-lb paper plus 50 standard envelopes.

Prices for the all-in-one Office Printers start at $1,645, and the triple-bin cut-sheet feeder costs $710.

Advanced Matrix Technology, 1157 Tourmaline Drive, Newbury Park, Calif. 91320.

COMMUNICATIONS

Controllers

Xylogics, Inc. has introduced the **Xylogics 780**, a VME communications controller said to feature a full 32-bit, instead of a 16-bit, data path.

The Xylogics 780 is said to be able to connect 16 ports to a multiuser Motorola, Inc. VMEbus-based host computer. It supports 16 full-duplex asynchronous ports at 9.6K bit/sec. or eight ports at 19.2K bit/sec. on a single board, according to the vendor. The controller features a real-time multitasking executive and includes a comprehensive set of self-test and in-service diagnostics.

The Xylogics 780 costs $2,495.

Xylogics, 144 Middlesex Tnpk., Burlington, Mass. 01803.

Multiplexers/Modems

Fibermux Corp. has announced the **FX6401**, a 48-channel multiplexer for use with both single and multimode fiber-optic cables.

The FX6401 reportedly supports user speeds from 300 bit/sec. to 2M bit/sec. and supports all commonly used interfaces, including RS-232, RS-449 and V.35. There are three models available: for single-mode fiber, the FX6401/SM; for multimode fiber, the FX6401/H; and the FX6401/L. Integrated test sets are said to continually monitor end-to-end system performance and initiate switch-over to standby common logic and module and standby fiber.

The prices for the FX6401 range from $3,500 to $20,000 per unit.

Fibermux, 21630 Lassen St., Chatsworth, Calif. 91311.

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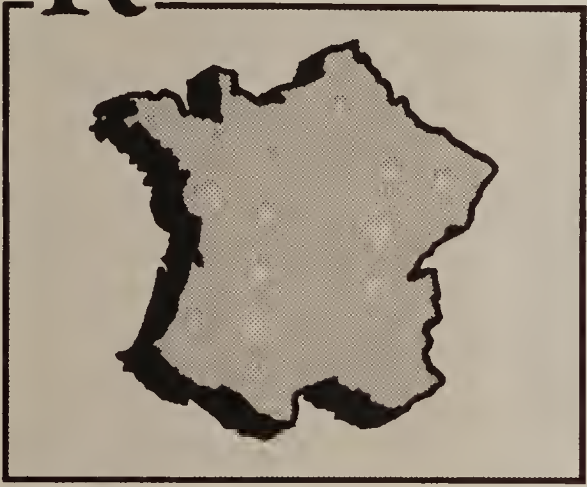

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Leemah Datacom Security Corp. has added the **Traqnet 1032 B** and the **Traqnet 2128 B** access control systems for modems to its Traqnet B series.

The Traqnet 1032 B 32-port model is priced at $275 per line card. It comes in a rack-mount unit, which is priced at $1,500, and an expansion unit, which is priced at $750.

As many as 16 line cards can be installed in the rack-mount version, according to a Leeman Datacom Security spokesman.

The Traqnet 2128 B is priced at $375 per line card. The rack-mount unit is priced at $2,890 and is said to be capable of protecting up to 32 lines.

The 32-line expansion unit costs from $785.

Leemah Datacom Security, 3948 Trust Way, Hayward, Calif. 94545.

Data Race, Inc. has announced **Race-AF**, an enhancement to its Race full-duplex, dial-up modem.

Added features include alternate AT&T Bell Laboratories 212A or 103/113-compatible originate and answer modes and an expanded IBM Personal Computer AT-compatible dial-up command set. Race-AF also has the following features: automatic hang-up after a preset duration of no activity, such as breaks, meetings or interruptions; automatic redial of the last number dialed; and automatic speed translation of received characters to the terminal.

Race-AF is available in two versions: Race-AF I, a single-channel full-duplex modem, and Race-AF II, a full-duplex modem with a second independent printer channel that grants remote users both terminal interaction and printer output simultaneously over one dial-up connection.

Race-AF I costs $1,645, and Race-AF II costs $1,845.

Data Race, 5839 Sebastian Place, San Antonio, Texas 78249.

Test equipment

Telecommunications Techniques Corp. has introduced the **Fireberd 6000 communications analyzer.**

The Fireberd 6000, said to aid in evaluating digital networks, operates from 50 bit/sec. to 15M bit/sec.

Fireberd 6000 includes analysis features such as a clock slip detector, frequency counters and an inverted clock detector, according to the vendor.

Utilizing a frequency synthesizer, the Fireberd 6000 is said to operate at programmable rates for synchronous, asynchronous and recovered clock applications.

According to the vendor, the 6000 offers advanced jitter generation and measurement capabilities including spectral analysis with multiple jitter masks and automatic frequency sweeps.

The Fireberd 6000 costs $7,995.

Telecommunications Techniques, P.O. Box 6027, 444 N. Frederick Ave., Gaithersburg, Md. 20877.

SYSTEMS & PERIPHERALS

Processors

HVE Engineering, Inc. has released the **Synergist Multibus/VMEbus** real-time translator.

The Synergist Multibus/VMEbus permits resource sharing between two computer systems having different bus architectures without incurring power or speed penalties or requiring additional software, hardware or intermediate controllers, the vendor said.

The Synergist Multibus/VMEbus is reportedly able to support 20- or 24-bit Intel Corp. Multibus addressing and 24-bit Motorola, Inc. VMEbus addressing.

Full-parallel, four-level, user-selectable VMEbus priority is possible with two modes of operation, according to the vendor.

Other features include user-defeatable automatic byte swapping and buffered address.

Synergist Multibus/VMEbus costs $1,495.

HVE Engineering, 1684 Dell Ave., Campbell, Calif. 95008.

Data storage

Interphase Corp. has introduced its **V/SMD 4200 Cheetah** storage module drive disk controller.

The V/SMD 4200 Cheetah reportedly boosts direct memory access throughput to 30M bit/sec. and above.

The increased bus throughput is said to be made possible by the Interphase BUSpacket Interface, which features virtual buffer architecture and zero-latency reads and writes.

The BUSpacket Interface also features AT&T System V Unix-optimized intelligent caching with 128K bytes of multitrack cache memory, according to the vendor.

The V/SMD 4200 Cheetah costs $3,350.

Interphase, 2925 Merrell Road, Dallas, Texas 75229.

Printers/Plotters

Toshiba America, Inc. has released its **P341E** dot matrix printer.

The P341E is a 24-pin wide-carriage printer said to operate at 216 char./sec. It is capable of producing correspondence-quality printing at 72 char./sec.

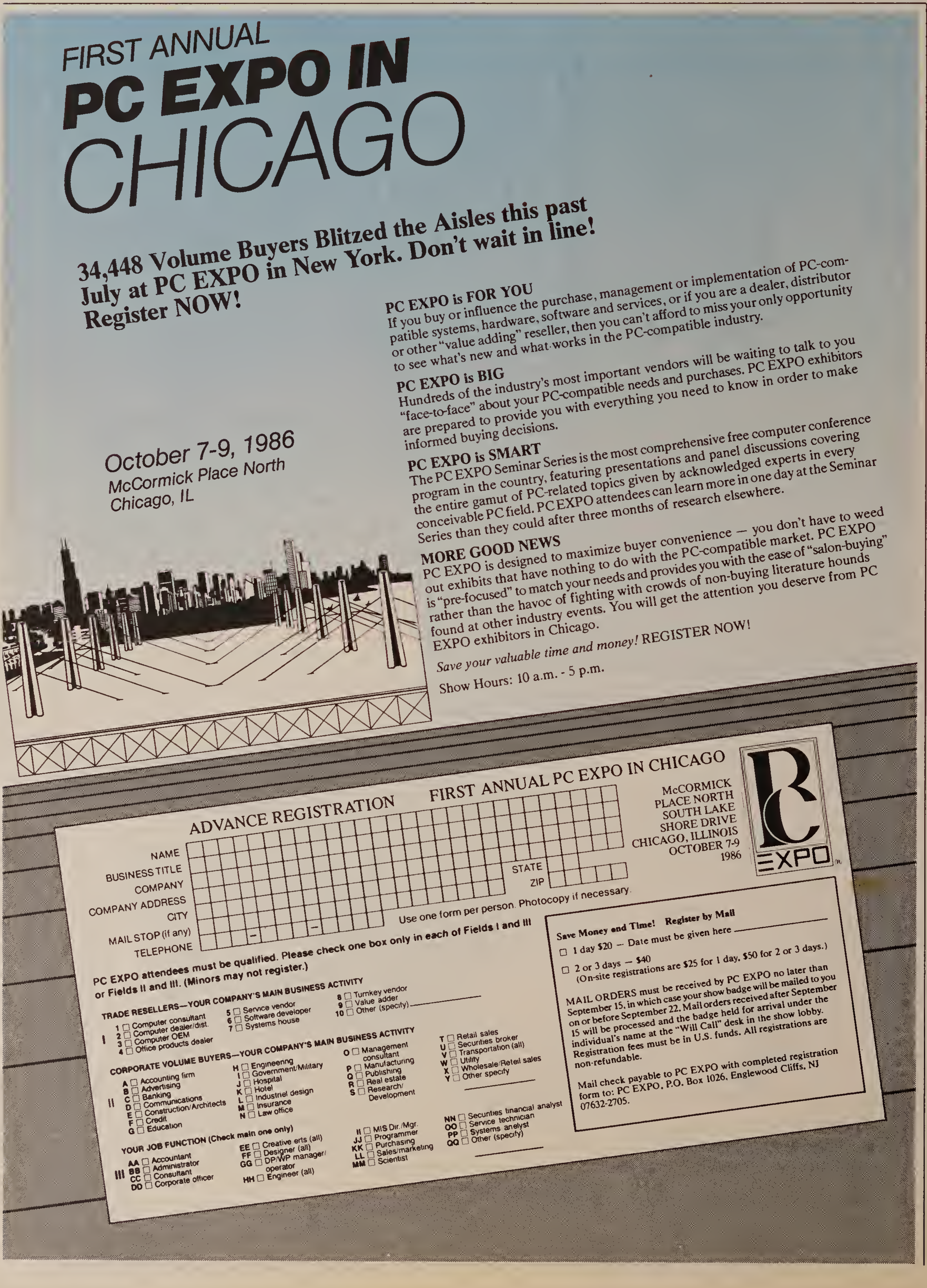
The printer is sold with a serial and parallel interface and is designed to use Toshiba's mechanical sheet feeder as well as its unidirectional tractor.

The P341E printer is similar to the P341 except for paper handling accessories, according to the vendor.

The P341E is priced at $999.

The unidirectional tractor costs $99.

Toshiba America, Information Systems Division, 2441 Michelle Drive, Tustin, Calif. 92680.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Merger activity to reconfigure European telecom market

Rising R&D costs spur consolidation

By Alan Alper

NEW YORK — The proposed combination of ITT's telecommunications business with a consortium of European companies is the first in what analysts expect to be a wave of merger activity that will restructure Europe's telecom market.

Last month, ITT proposed to sell its telecommunications and office automation equipment unit for $1.8 billion to the European consortium led by France's state-owned Compagnie Generale d'Electricite (CGE) [CW, July 7]. The French government recently said it would not oppose the merger, which will form the world's second largest telecom equipment vendor after AT&T.

The ITT-CGE marriage reflects the chaotic state of the telecommunications business, an industry beset by escalating development costs, confusion over industry standards such as Integrated Services Digital Network and decelerating growth rates. Such problems have created an environment conducive to consolidation, analysts have suggested.

The dozen or so companies currently locking horns in European telecommunications may be reformed into two or three competing consortia, according to Fritz Ringling, director of communications research at the Gartner Group, Inc. in Stamford, Conn.

"What you have now is companies jockeying for position to join alternate groups," Ringling says. "It's necessary since no one company besides AT&T or Siemens AG can afford to develop the next-generation product."

> ***'No one company besides AT&T or Siemens AG can afford to develop the next-generation product.'***
>
> — Fritz Ringling
> Gartner Group, Inc.

Opposing the ITT-CGE group, Ringling says, will be a second European consortium, possibly headed by Siemens AG of West Germany, and an existing joint venture between AT&T and N. V. Philips of the Netherlands.

Siemens is rumored to be the leading candidate to acquire Compagnie Generale des Constructions Telephonique (CGCT), the central office switch operation said to be offered for sale by the French government. If Siemens successfully takes over CGCT, Ringling suggests, Siemens would be joined by at least one UK company, probably Plessey PLC, or Italtel, the Italian telephone company.

"The governments recognized some time ago, and now the professionals are beginning to understand, that there has to be a reduction in the number of companies in the marketplace," Ringling says. "Companies can't develop products only for the national market but must export to recoup their investment."

Because it is dominated by a non-European interest, the AT&T-Philips venture will not be a significant factor in the European telecommunications market, according to Ringling. "AT&T-Philips will probably get some business in Britain and parts of Holland and Belgium but will be strongest in Philips' traditional markets in the Middle East, South America and Africa," he notes.

Meanwhile, the CGE alliance may prove to be the only way ITT can continue to participate in the telecommunications industry.

ITT's decision indicated the firm was no longer willing to make the heavy investment required to stay competitive in a very capital-intensive business, analysts said at the time the deal with CGE was disclosed. The announcement followed ITT's development difficulties and escalating costs associated with its System 12 telephone switch.

ITT will retain a 30% stake in the joint venture, enabling it to reduce mounting internal debt by transferring approximately $1 billion of its $2.6 billion in debt to the new entity.

"ITT management felt that to retain a substantial part of a big telecommunications company was the way to go," says Kenneth Bosomworth of market researcher International Resource Development, Inc. in Norwalk, Conn.

"This way, if things go well, it will get to share in the profits, but if things don't, it won't be a big deal at the bottom line," Bosomworth adds.

The same rationalization very likely is being considered at most of the leading European telecommunications firms as well, analysts conclude.

West German electronics and computer groups Bosch AG and Nixdorf AG, however, recently said they are unlikely to participate in the new ITT-CGE joint venture.

Claudia Marwede-Dengg of the Computerworld International News Service contributed to this report.

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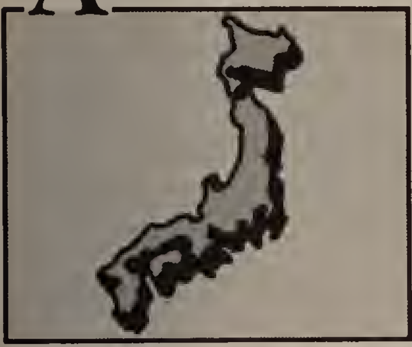

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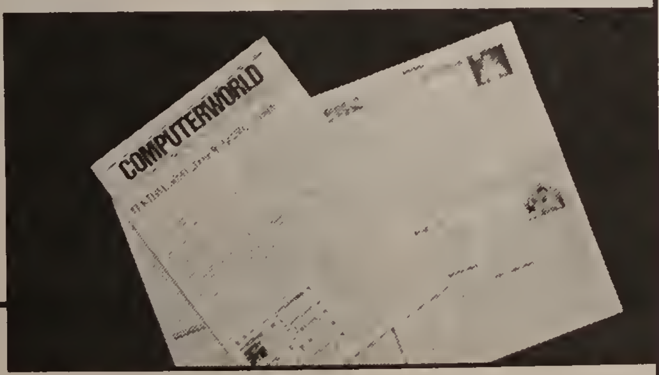

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IBM Europe strategy praised

By Amiel Kornel
Computerworld International News Service

PARIS — IBM Europe's reorganization [CW, Aug. 4] will seek to place greater emphasis on vertical markets and emerging opportunities in telecommunications in order to enhance revenue.

Units in each country will acquire greater responsibility for mapping out local strategies, and the Paris-based European headquarters will provide horizontal support through four newly created services.

The reorganization will officially take place Sept. 1.

Initial user response to the restructuring plans appears to be favorable.

Pierre Amy, head of the IBM users group at the French banking giant Credit Agricole, says he applauds the move to delegate greater authority to Big Blue's French subsidiary.

"My IBM contacts were quite quickly powerless when faced with the big structures of IBM Europe," Amy says. "As a client, this reorganization should bring me something because the administrative yoke of IBM Europe was too heavy."

The moves, not unlike restructuring efforts carried out at other multinational companies operating in Europe, come as increasingly demanding overseas clients command an ever greater share of U.S. firms' corporate revenue.

While IBM revenue grew only 9% worldwide to $50 billion in 1985, European revenue climbed 17% to about $13 billion.

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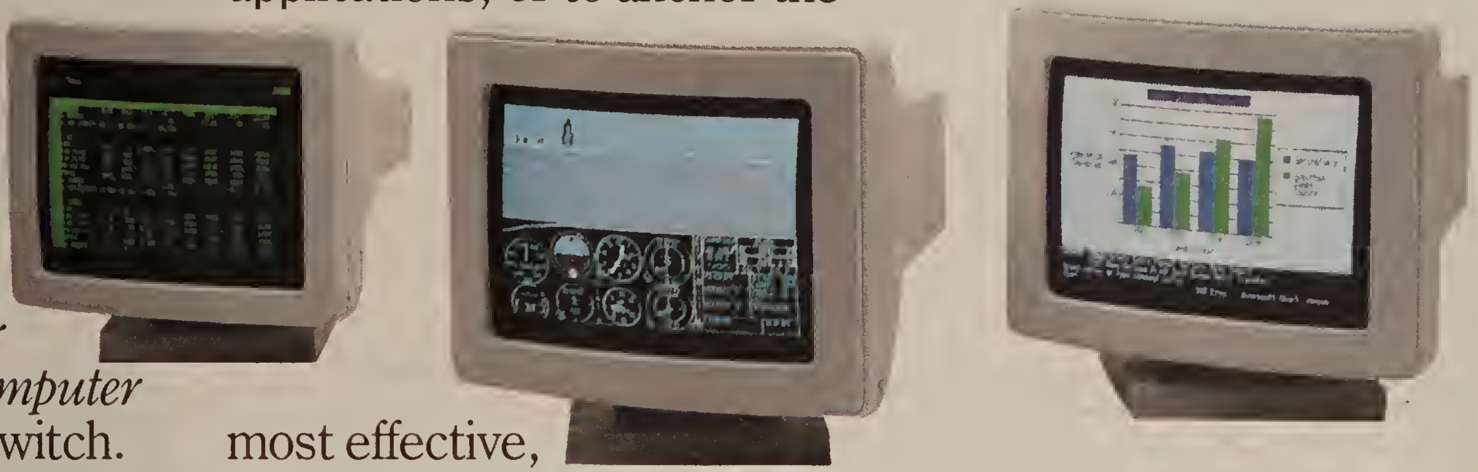

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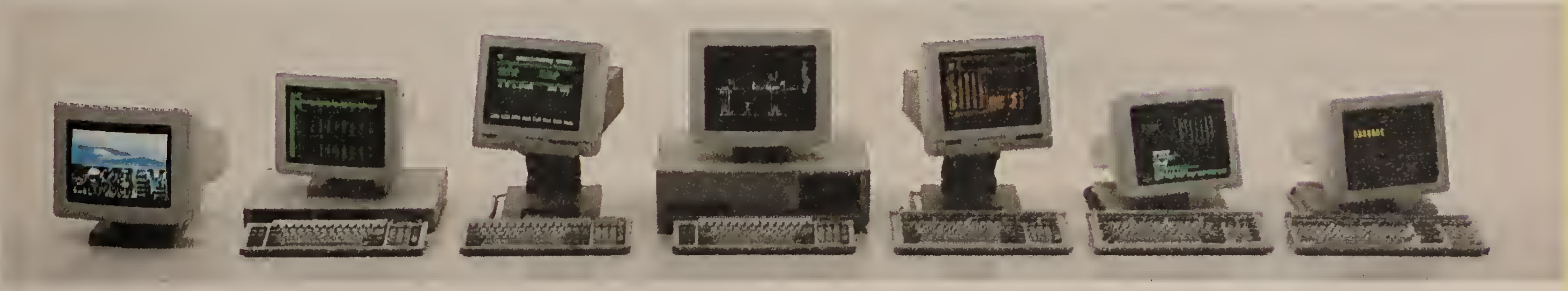

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**Dataquest 1985 terminal shipment update.*

Speculation over Micropro resignations points to finances

Successors seek to reverse losses

By Maura McEnaney

SAN RAFAEL, Calif. — Turmoil at Micropro International Corp. moved from the bottom line into the board room recently when the company announced the resignations of President and Chief Executive Officer H. Glen Haney and two key vice-presidents.

Last week, Micropro appointed Leon Williams, 41, to succeed Haney as president and CEO Sept. 15. Williams had been senior vice-president of systems planning and technology at McGraw-Hill's Business and Financial Information Cos.

Haney had been with Micropro for three years, succeeding Micropro founder Seymour Rubenstein. Observers speculated that the resignation may have been forced by the firm's financial backers, who were unhappy over Micropro's poor earnings results. Included among the financiers was venture capitalist Frederick Adler.

Haney will be a consultant to Adler's venture capital firm, Adler & Co. Current Adler & Co. member Gari Grimm has been named Micropro general manager.

Resigning from Micropro were Peter S. Kent, vice-president of finance and administration, and Frank Frost, vice-president of world sales.

While the resignations indicate significant changes at Micropro, analysts are not convinced that the move will help the fortunes of the microcomputer word processing software company, which has recently been plagued by declining sales and climbing losses [CW, June 30].

"It's like rearranging the deck chairs on the Titanic," said Harvey H. Bundy III, an analyst with William Blair & Co. in Chicago.

Once the leader in word processing with its Wordstar program, Micropro began losing market share about two years ago. In the third quarter ended May 31, Micropro lost $2.4 million.

The company attributed much of the loss to the bankruptcy of distributor First Software Corp., which owed Micropro $1.4 million. So far this year, Micropro has lost $900,000 on $27.7 million in revenue.

"I'm not sure Haney wasn't a scapegoat for problems beyond his control," said analyst Robert Lefkowits of Infocorp in Cupertino, Calif.

Just as the company began concentrating on improving its word processing packages, the market shifted and now requires diversity in the product line, Lefkowits said.

Despite the declining sales, Micropro is far from sinking, Lefkowits added. He noted that a new version of Wordstar, anticipated in September, could continue to beef up revenue at Micropro.

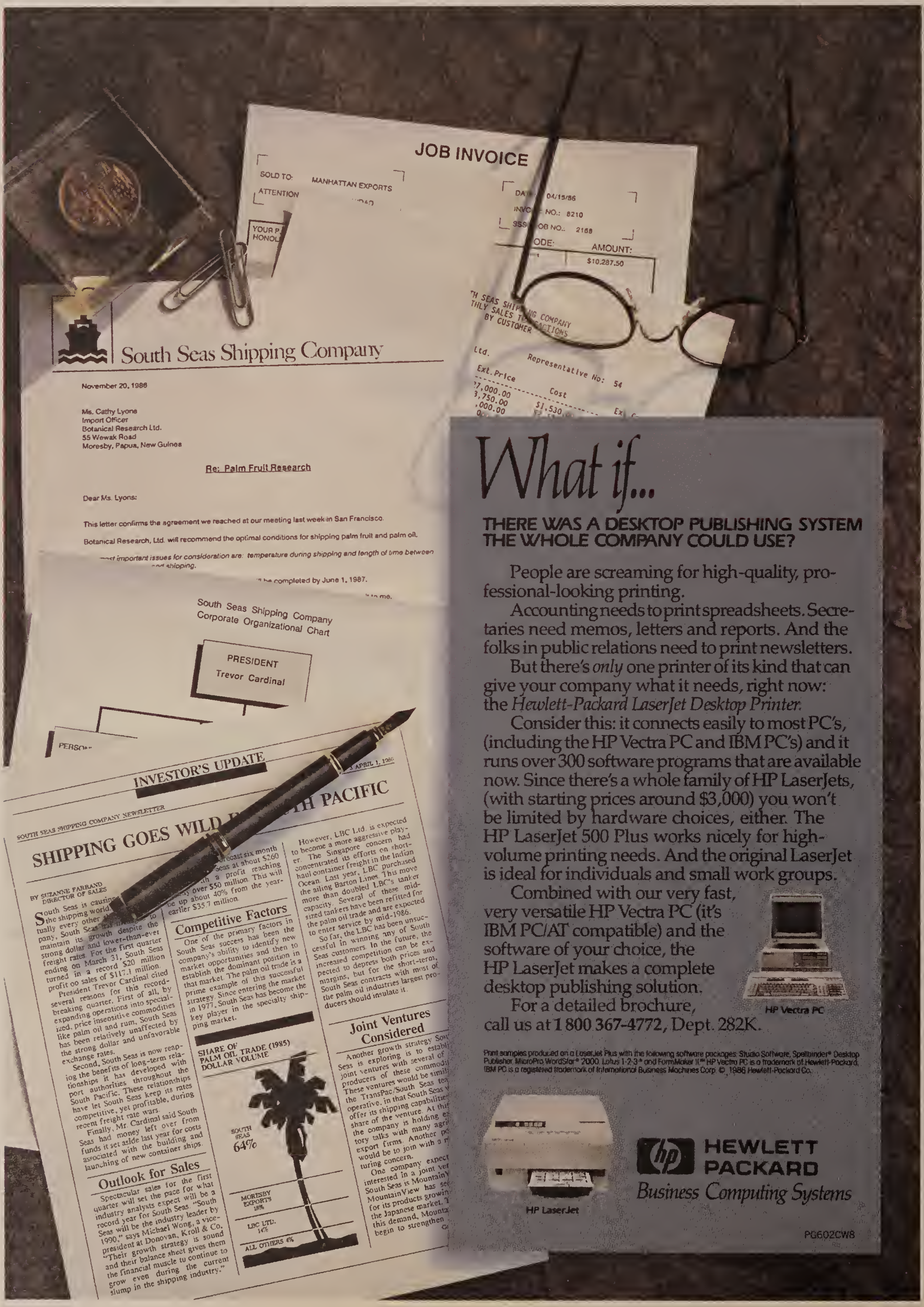
"They're still a $30 million company," he said. "With 1.5 million users, they should be able to get at least 10% to upgrade. I'd love to run a little company that can make $10 million just by sneezing."

NET buys Comdesign

REDWOOD CITY, Calif. — Reflecting the continued consolidation of the T-1 multiplexer market, T-1 vendor Network Equipment Technologies Co. (NET) recently agreed to acquire Comdesign, Inc.

Comdesign, based in Santa Barbara, Calif., manufactures products for the low-speed data communications market. NET will acquire Comdesign in a stock transaction of undisclosed value.

NET is expected to integrate some Comdesign products with its network management system and resell them, and Comdesign will remarket T-1 products jointly developed with NET.



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EXECUTIVE CORNER

Frank L. Chisholm, 38, has joined Soft-Switch, Inc. as the new president and chief operating officer, replacing **N. D'Arcy Roche**, who has left the company. Chisholm, formerly executive vice-president at Cullinet Software, Inc., will be responsible for Soft-Switch's day-to-day operations. He will report to **Michael D. Zisman**, founder, chairman and chief executive officer.

■

Edward M. Esber Jr. has been elected chairman of Ashton-Tate. He will continue as president and chief executive officer. The company's shareholders also elected three new members to the board: **James Castle**, 49; **F. William Graham**, 48; and **Henry Alan Sweetbaun**, 48. These additions bring the total membership of the board to eight.

■

On-Line Software International, Inc. has announced the appointment of **Howard P. Sorgen** to both president and the newly created position of chief operating officer. **Jack M. Berdy**, company founder, will remain chairman and chief executive officer. Previously, Sorgen was executive vice-president at Manufacturers Hanover Trust Co.

■

Delbert W. Yocam has been appointed to the position of executive vice-president and chief operating officer at Apple Computer, Inc. Yocam joined Apple in 1979. Most recently, he was executive vice-president and group executive of product operations. Previously, he held the position of executive vice-president and general manager of the Apple II group, which developed, engineered, manufactured and marketed all Apple II products.

■

Bob Obuch has been named executive vice-president and chief operating officer in charge of North American operations at Digital Research, Inc.

In this newly created position, Obuch will oversee the departments of engineering, marketing and sales.

■

ITT Corp. has announced the appointment of **D. Mark Fowler** as president and general manager of ITT's Business Systems Group. Fowler was most recently senior vice-president of product management and development for the Information Systems Division. In 1983, Fowler founded and became chairman and president of Zaisan, Inc., a manufacturer of integrated voice/data workstations.

■

Jerome L. Dreyer, president of ADAPSO, the computer software and services industry association, has resigned from the association's staff. Dreyer, who has served as ADAPSO's chief staff officer since 1967, will act as a consultant in the transition of staff management. The ADAPSO executive committee has named **Luanne James**, chairman of Argonaut Information Systems, to act as ADAPSO's interim executive director.

■

Thomas H. O'Donnell has been appointed to the newly created position of chief operating officer at General Computer Corp. O'Donnell, who spent 17 years with IBM, joined General Computer in February as vice-president of marketing.

■

Gigabit Logic, Inc. has announced the appointment of **John D. Heightley** as the company's new president and chief executive officer. **Heinrich Krabbe**, former president, will remain chairman of the board.

■

Robert A. DiNanno has been appointed to the new position of vice-president of operations at Encore Computer Corp. DiNanno will be responsible for the company's manufacturing and new product programs. Previously, DiNanno served as vice-president of manufacturing at Adage, Inc.

■

Andrew C. Knowles III has been promoted to chairman of Prime Computer, Inc.'s computer-aided design and manufacturing (CAD/CAM) and workstations group, as the company restructures its executive positions in CAD/CAM. **Robert A. Fischer**, formerly chairman of McDonnell Douglas Information Systems Group, will serve as group president and chief executive officer.

■

Two veteran aerospace executives have been promoted at Martin Marietta Corp.: **Dan A. Peterson** to senior vice-president for information systems and **Gareth D. Flora** to succeed Peterson as vice-president for business development.

■

Businessland, Inc. has announced the appointments of two senior vice-presidents to its corporate and field operations. **James A. Heisch** has been promoted to senior vice-president of finance and will remain the company's chief financial officer. **Luther J. Nussbaum** has been promoted to senior vice-president of marketing and operations.

■

Egil Juliussen, formerly president and chairman of Future Computing, Inc., has joined Isaacson, Inc. as chairman and chief executive officer.

Isaacson was formed in December 1985 by **Portia Isaacson**, who is president, and **Dale Dukes**, vice-president.

■

Robert P. Gardner has been promoted to president and chief executive officer of Enmasse Computer Corp. Most recently, Gardner was executive vice-president at Enmasse; prior to that, he served as a managing partner of Bedminister Capital Group, a high-technology venture group.

■

David Larson has been named vice-president and chief financial officer at Baron Data Systems Co., which is a leading supplier of computer systems for the legal and medical markets.

IBM lets its defenses down

From page 110

architecture in the world. But we also intend to focus on linking the SNA networks with others."

What other networks? Lautenbach said that IBM will support Integrated Services Digital Network and provide links between SNA and Telenet from GTE Telenet Communications Corp., Tymnet from McDonnell Douglas Network Systems, Inc. and other similar networks.

What is the reason that IBM may be opening up to the world? In a word, it is its growth — or lack thereof if the firm does not open up.

The recent comments by the senior IBM executives suggest that they are finally coming around to correcting the flaws in some of their product strategies from the early 1980s. One of these was the assumption of a continuous 50% or more growth in million instructions per second (MIPS) demand, fueled by high Personal Computer shipment volumes.

"The PCs will help drive up the MIPS demand," predicted "Buck" Rodgers, then IBM's senior vice-president of marketing, at a March 1984 meeting for financial analysts in Boca Raton, Fla. He predicted the 50% MIPS growth rates would continue in 1984 and 1985.

As we know now, that didn't happen. Where did Rodgers and IBM go wrong? They failed to realize that, without the communications networks and software in place, all those millions of PCs were like telephone sets with only the intercom and calculator features on them.

In other words, as hard as the corporate PC users tried, they could not easily talk to each other. Such an environment was more likely to reduce the demand for switching equipment, or mainframes in IBM's case, rather than add to it.

Lautenbach said at the San Jose meeting that IBM is opening up its communications strategy because the company thinks such a move would help the growth of MIPS demand. Later, Akers expanded on this by saying, "The more devices, ours and theirs [IBM competitors], that we can have connected to our systems, the better it is for our business."

Complementing IBM's recent openness is its new systems integration marketing strategy. To the customer, IBM presents itself as a consultant that understands the customer's business and can "put it all together."

The effort seems to be paying off. At General Motors Corp.'s Buick Division, IBM and GM have jointly developed the software to computerize the dealer's service departments — based on IBM equipment, of course.

American Airlines and IBM have joined up to develop a new system for American's travel agents. And the beat goes on.

Interestingly, there is not much new to IBM's "new" marketing strategy. IBM is still the same old friendly supplier that was selling solutions while its competition was selling products. The result was a level of account control that often left IBM competitors baffled. The only difference from the past is that IBM is now including communications products among its solutions.

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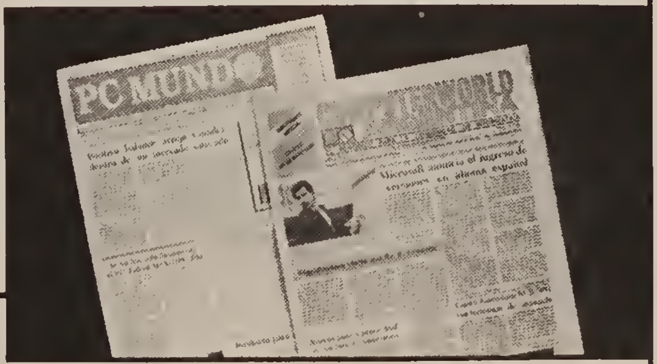

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Software developers must take steps to protect own secrets

OUTSIDE LINES
L. J. Kutten

It is generally accepted under U.S. law that anyone can examine and analyze any product obtained without restriction on the open market in order to discover how it works. This is known as reverse engineering, and it is a practice approved by the U.S. Supreme Court.

With software, this right to reverse-engineer means there is very little or no trade secret protection in software unless the software is sold with restrictions. Accordingly, a developer that wants to retain a trade secret in commercially distributed software must take steps to protect it. Typical protective steps include the following:

- Use of a license agreement under which the licensee obtains only a limited right to use the software and no rights to disassemble or decompile the software.
- Contractually prohibiting the making of archival copies, prohibiting further resale or distribution of the software and requiring disposal of all copies.
- Distributing the software in object code only, with a contractual provision saying the user will not attempt to reverse-engineer the software.
- Placing proprietary notices on the software media and on the opening screen of the software.
- Using coded software that disappears or becomes nonfunctional if not updated.
- Limiting the amount of documentation transferred with the package.
- Requiring the licensee to notify the licensor of any circumstances that would indicate an unauthorized disclosure or use.

If the trade secret software involves patentable subject matter, the owner has the option of using either trade secrecy or patent law to protect the software, but not both.

If patent protection is sought, then trade secret protection is lost to the extent the secret is revealed in the patent. That portion not disclosed can retain its trade secret status.

If patent protection is chosen, the applicant must disclose "the best mode" of working the patent. This does not mean that the actual computer program or trade secret must be revealed, but that sufficient information must be presented to allow the invention to be worked by others at the end of the patent monopoly.

Unlike most license agreements, a contract between a software developer and the U.S. government or a government agency is controlled by federal procurement regulations, not the terms of the contract.

It is very possible that an unknowing trade secret owner could sign a government contract containing a "Rights in Technical Data and Computer Software" clause that grants the government unlimited rights to the software.

Kutten is a member of the Missouri and Illinois bars. His book, Protecting Computer Software: Law and Forms, *will be published later this year by Kluwer Law Book Co.*

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A PUBLICATION OF CW COMMUNICATIONS

Used computer mart sees growth

From page 110

Inc., a Fairfield, Conn., broker of used Sperry Corp. and Hewlett-Packard Co. hardware. "We had an instance recently where a Fortune 500 company in our area laid off 200 people and at the same time was purchasing an awful lot of equipment from us," he recalls.

Beyond saving money, corporations are increasingly attracted to used equipment because they are assured of compatibility with existing products or networks, vendors say.

"Most people have a significant investment in software and consequently don't want to risk having any problems when they bring in new equipment," says Sonny Monosson, president of American Used Computer Co., a supplier of Digital Equipment Corp. and AT&T systems and peripherals in Boston. "Sure, there are people who want to be on the leading edge, but there are many who don't care and accept used computers."

A recent study commissioned by Monosson estimated the domestic market for used computers at about $4.5 billion. Unlike other suppliers, Monosson says he believes that regardless of economic conditions, market opportunities for used equipment are omnipresent.

One thing that has changed over the years is that customers have become more sophisticated when it comes to buying used computer equipment. "Large corporations and government institutions are finally realizing that 'used' doesn't mean anything more than the equipment is broken in," Monosson explains.

ON OCTOBER 8, WE FOCUS ON OFFICE AUTOMATION

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We'll look into the future to see what's in store. And we won't just look at products, but vendors, too. Complete with inside information on their evolving product paths.

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Within the automated office the concept of the information center is paying dividends. In October, our special section will examine the IC's changing role, and the new ways MIS/DP professionals and end users are working together toward the productivity increase goal. We'll talk with an info-center manager for a firsthand view of the new functions the IC is providing. And finally, we'll profile some major IC sites, their functions and technologies.

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But hurry, closing is August 29.

For more information, contact Ed Marecki, Vice President/Sales, Computerworld Focus, 375 Cochituate Rd., Framingham, MA 01701-9171, (617) 879-0700. Or call your local Computerworld sales representative.

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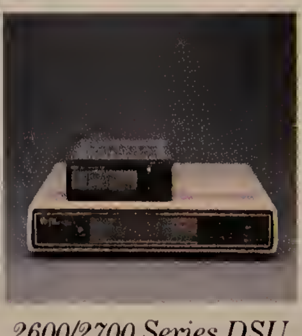

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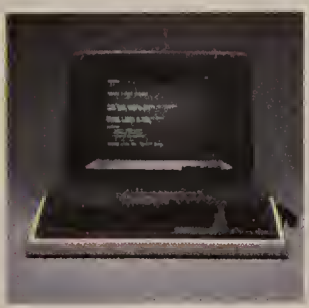

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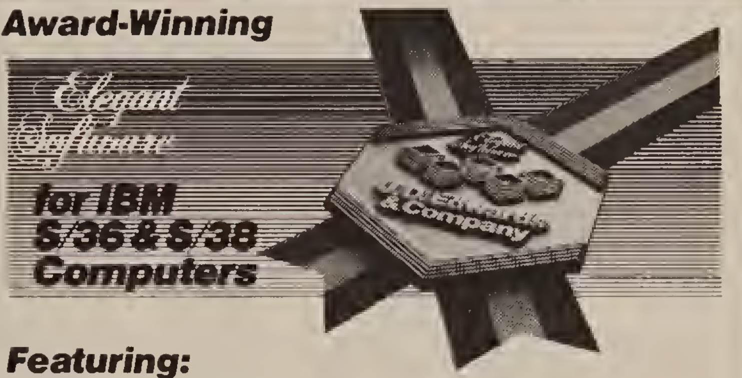

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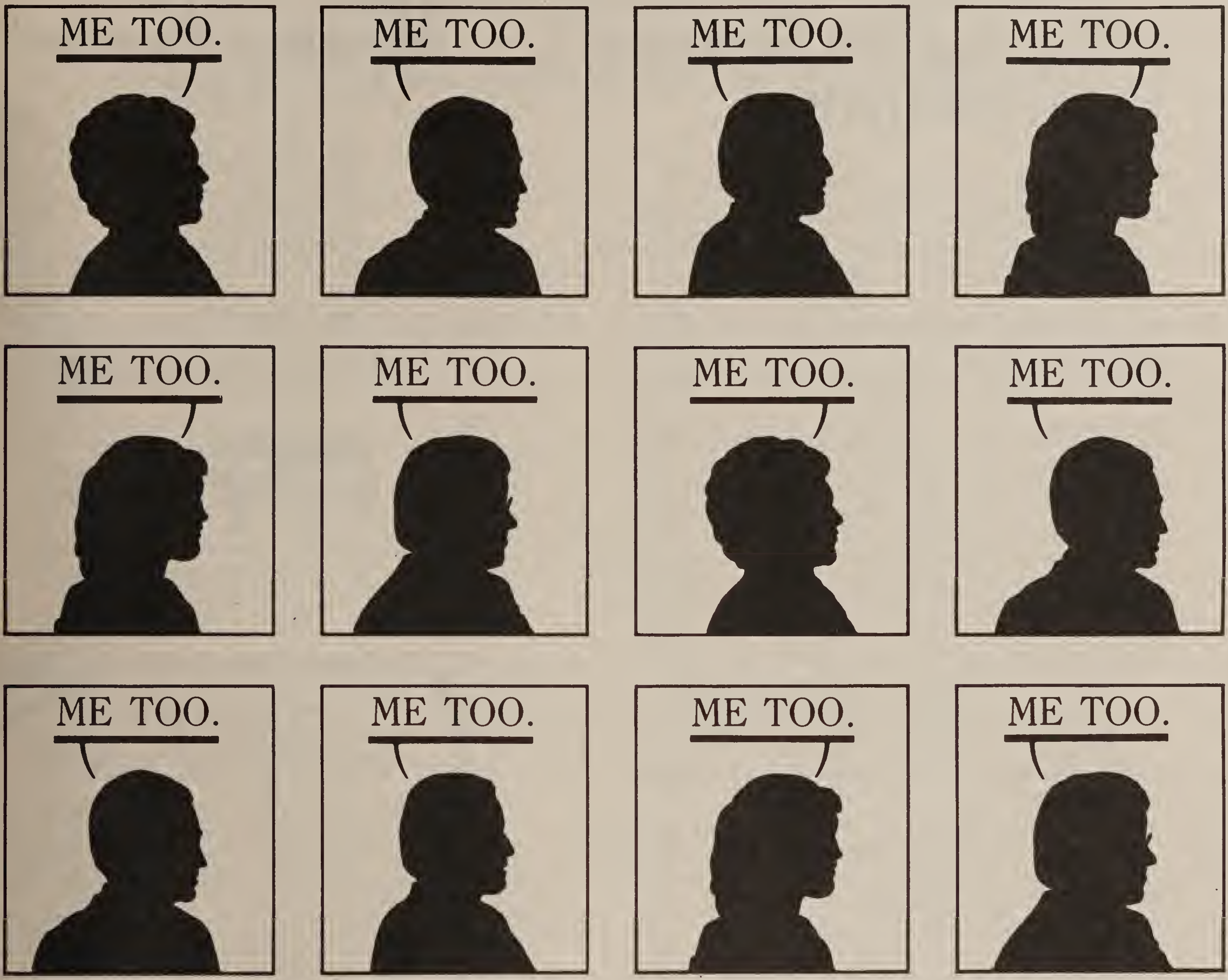
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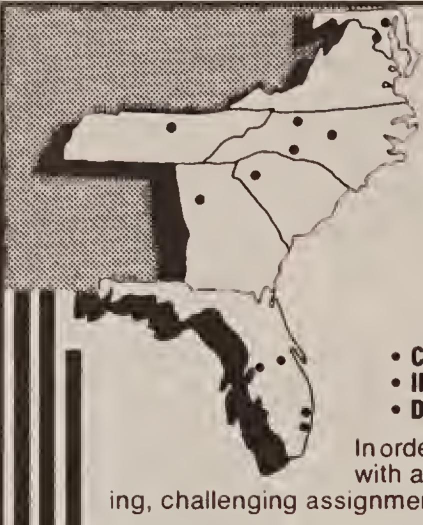

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Javelin lays off domestic sales reps

Firm says direct costs expanded too quickly

By David Bright

CAMBRIDGE, Mass. — Saying that it had expanded direct sales costs too quickly, Javelin Software Corp. last week laid off an undisclosed portion of its domestic sales force.

In the reshuffling, Javelin's total work force was reduced from a number in the high 30s to just under 30, according to Robert Firmin, Javelin's chairman.

Firmin said the action would "bring expenses in line with domestic revenue," which had not grown as fast as expected.

Sales reps have become contractors

Some of the laid-off sales representatives have become independent contractors for Javelin, according to Firmin.

While the field sales force has been reduced, the total number of sales, presale and postsale support people will remain the same or increase slightly, he added.

"Some faces will change, but our presence in the field is not going to be diminished at all," Firmin said.

International sales growing

International sales through a distribution agreement with Ashton-Tate are growing faster than domestic sales and currently account for about half of Javelin's income, Firmin said.

However, he claimed that overall revenues were on target. He also said that the company would become profitable in the fourth quarter of this year.

Backed by more than $4 million in private funding, the 3½-year-old company has been shipping its Javelin business analysis package for the IBM Personal Computer since October.

Cullinet suffers first loss ever

From page 110

a major product announcement on Sept. 9, one, he hinted, that will put Cullinet in the software development marketplace.

Chapman also emphasized that Cullinet is positioning itself to become a player in the minicomputer or departmental processor market, one that it believes will grow faster than mainframe software.

In addition to its recent acquisition of Esvel Co., a San Jose, Calif.-based developer of DBMS software for the Digital Equipment Corp. VAX line, Cullinet has purchased a VAX applications vendor.

Cullinet acquired Computer Strategies, Inc. of Grand Rapids, Mich., which produces manufacturing software for the automotive and related industries.

The movement into the VAX market follows earlier moves by such mainframe software vendors as Cincom Systems, Inc. and Software AG.

"It looks to us like an important strategic move. VAX software could be a third of our revenue by fiscal 1988," Chapman said, citing the installed base of 20,000 VAXs and the fact that 50% of Cullinet's mainframe software customers are also users of the VAX.

Wall Street analysts have frowned on Cullinet's initial reluctance to commit itself to interfacing its products with IBM's DB2 relational data base management system and its data access command set, SQL. Cullinet allowed its hands-off stand to gradually erode into a commitment to provide support for SQL, and the vendor says its Online Query product will offer an SQL option this fall.

"Cullinet's current poor results are caused by a number of factors, including the re-emergence of IBM as a major participant in the data base management systems market via DB2," said Christopher Mortenson of Alex Brown & Sons. "We expect DB2 SQL to be successful as the market looks for standards upon which to build its mission-critical systems and believe this will continue to make life difficult for Cullinet."

Although Cullinet has announced it will provide support for SQL, Chapman was not specific about when that support would materialize for two products cited in addition to Online Query — the fourth-generation language Application Development System and Cullinet's version of Cobol.

Strong earnings, market savvy make Cray a favorite

ACTIVE ISSUES
Kathy Porteus

At a time when uncertainty prevails among technology stocks, Cray Research, Inc. (CYR — 82) is considered a sure bet.

What separates Cray from other computer firms is the predictability of its stunning year-to-year earnings increases. Its financial visibility is clear, owing to bookings that typically occur a year in advance.

Rich Edwards, analyst with Robertson, Colman & Stephens, expects Cray to ship 51 systems next year and estimates the company will earn $5.10 to $5.20 per share in fiscal 1987, which assumes the existing 46% tax rate.

Investors remain confident of Cray because the supercomputer market is largely immune to economic conditions. According to Edwards, what fuels demand for supercomputers is the basic replacement of physical experimentation with computer simulation and modeling.

In addition to clear earnings visibility, Cray benefits from strong fundamentals that will likely support its future growth. According to Rick Martin, analyst with Sanford C. Bernstein & Co., not only is the number of units shipped each year growing, but the number of processors in each new installation is also increasing. Such a trend raises the average price per system.

Furthermore, Cray tends to sell more equipment than it leases. In its June 1986 quarter, Cray's shipments were 100% purchased, Martin says.

Because of the high cost of market entry, analysts foresee limited competition for Cray. Control Data Corp.; ETA Systems, Inc.; NEC Corp.; and Fujitsu Ltd./Amdahl Corp. are still newcomers to the U.S. supercomputer market.

Even as competition intensifies, Cray should not lose market share, says Jeffrey Canin, senior technology analyst with Hambrecht & Quist. Canin says Cray is responding to competition with continued funding of major research and development programs, including the development of three additional processor families. The first of these, an eight-processor series known as YMP, is due in 1988.

Canin says Cray is positioning its customer base for upgrades to these future products by standardizing all new systems and migrating some existing systems to Unicos, Cray's Unix implementation.

To determine the upgrade potential of Cray's installed base, Sanford's Martin conducted a survey last year in which the average Cray customer projected the useful life of its supercomputer at just three years.

"Although everyone focuses on its technology," Martin observes, "Cray has superb marketing." According to Martin, Cray's service and support build tremendous customer loyalty. Cray is also expanding the range of potential applications for its systems, Edwards of Robertson, Colman adds.

Since Cray's stock reflects all of these positive factors and sells at roughly a 100% premium to the market multiple, is this still a good time to invest in Cray?

"The easiest money has been made in Cray," Hambrecht & Quist's Canin says, "but over the next 12 to 24 months, the stock is likely to still out-perform computer issues."

Traditionally, Cray has traded between 20 and 30 times calendar earnings, Edwards says. Based on his 1986 estimate of $4.00 per share, Edwards says, "At 120, the stock is approaching full valuation on an historical basis."

Considering tax reform will likely add 50 to 75 cents to Cray's 1987 street estimate of $5.00 per share, "the stock doesn't seem so very expensive," Martin says, "when trading on 1987 expectations."

Porteus is president of Strand Research Associates, a Centerville, Mass.-based company that provides customized research services for financial and high-tech firms.

HP announces earnings increase

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orders accounted for most of the increase, rising 51% to a total of $863 million.

U.S. orders increased 9% from $990 million a year ago.

'Only surprise'

"The only surprise in these numbers is the order increase," said Tim McCollum of Dean Witter Reynolds, Inc. "I was thinking along the lines of 15% to 20%."

For the nine months ended July, HP recorded revenue of $5.1 billion, up 7% from a year ago.

Net earnings of $1.40 per share were down 1% from $362 million, or $1.41 per share, in the first nine months of 1985.

Moderate growth seen

HP Chief Executive Officer John Young said in a prepared statement that despite the improvement in international orders in the third quarter, the company anticipates moderate growth for the year.

"While business has improved, we remain cautious," he said.

"Capital spending by our customers is still sluggish, and we see no indication of a significant turnaround," Young added.

Ashton-Tate gets revenue boost

From page 110

While Ashton-Tate enjoys strong sales of its industry standard applications, it sacrifices more advanced, innovative capabilities, according to Goulde. "Although it's not technically innovative, people feel secure buying Multimate, for example," he said.

Other data base products have more functionality than Dbase III Plus, Goulde said, citing Microrim, Inc.'s Rbase series and Paradox from Ansa Software. "Both have the ability to read and write a much larger variety of files from other products."

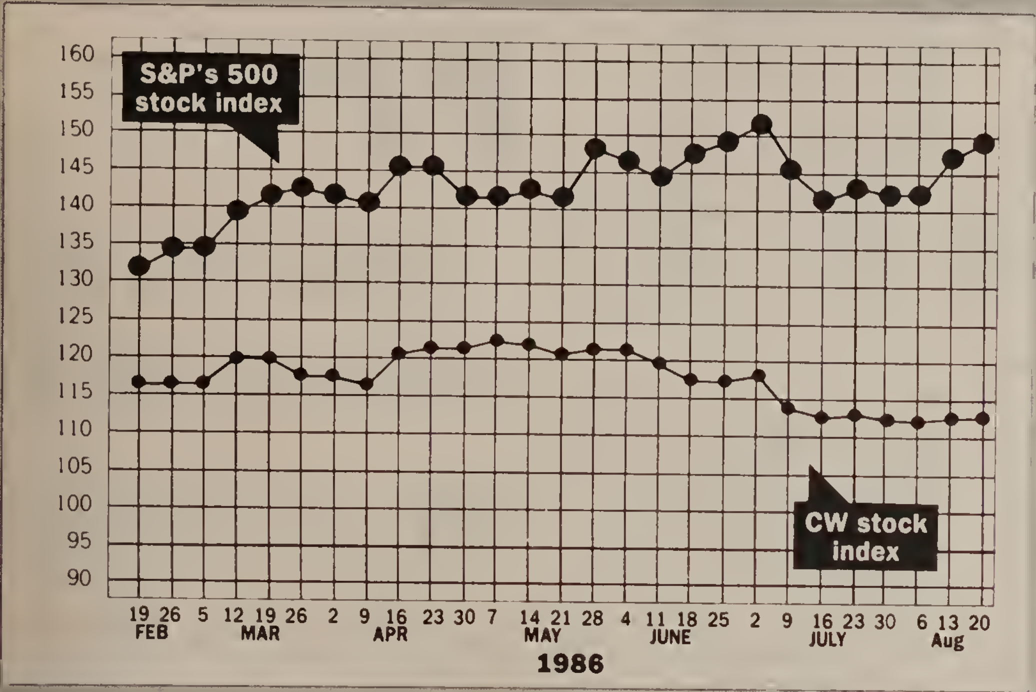
During the second quarter, Ashton-Tate reported an increase in overseas sales, partly due to an international distribution deal with Javelin Software Corp., said Edward M. Esber Jr., Ashton-Tate's chairman, president and chief executive officer.

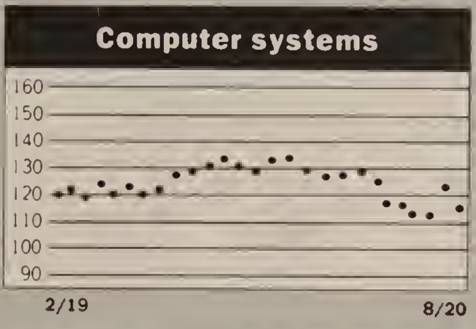
The firm also formed its fifth and sixth micro-to-mainframe link agreements, announcing deals with Cincom Systems, Inc. and Comshare, Inc.

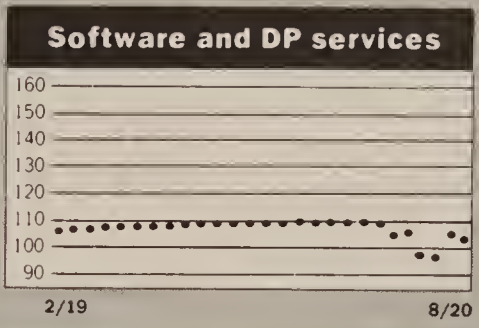
Second-quarter activity included the debut of Dbrun III Plus, an execute-only version of Dbase III Plus. Ashton-Tate has entered the Apple Computer, Inc. Macintosh market with Dbase Mac. The firm also recently entered a pending acquisition with Decision Resources, Inc.

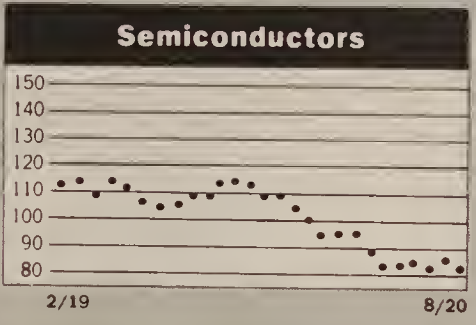
MITCHELL J. HAYES

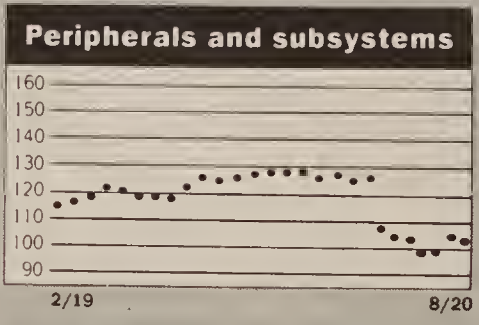
Computerworld stock trading index





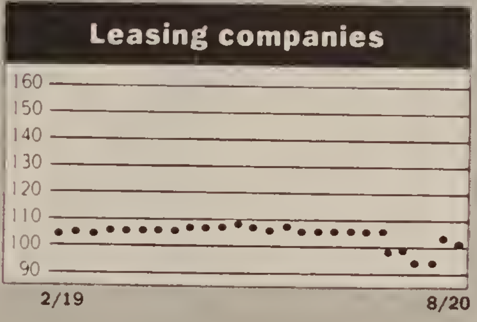


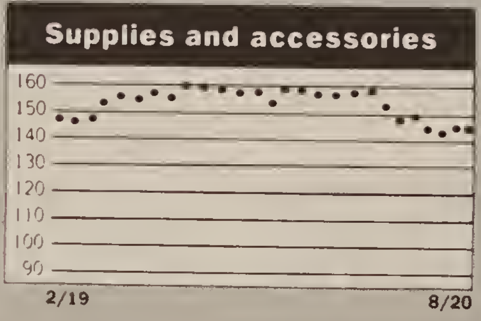




All indexes reflect a historical base of 100 on Dec. 31, 1984, and trace stock market performance in relation to that base. The CW stock index represents the unweighted average performance of the six categories of computer industry stocks.

	8/13/86	8/20/86
Computer systems	122.0	**115.9**
Software and DP services	105.1	**102.9**
Peripherals and subsystems	104.6	**103.2**
Supplies and accessories	145.5	**145.2**
Semiconductors	85.6	**81.5**
Leasing companies	102.0	**100.6**
CW stock index	113.4	**112.9**
Standard and Poor's 500 stock index	146.9	**149.3**





Computerworld stock trading summary

CLOSING PRICES WEDNESDAY, AUGUST 20, 1986

EXCH		52-WEEK RANGE (1)		PRICE CLOSE AUGUST 20 1986	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS					
O	ALPHA MICROSYSTEMS	8	4	4.38	+0.1	+2.9
O	ALTOS COMPUTER SYS	19	10	12.75	+1.4	+12.1
A	AMDAHL CORP	19	10	17.88	+0.1	+0.7
O	APOLLO COMPUTER INC	19	9	11.75	-0.3	-2.1
O	APPLE COMPUTER INC	39	15	36.25	+0.3	+0.7
N	AT&T	26	20	23.63	+0.1	+0.5
N	8URROUGHS CORP	73	52	71.13	-0.1	-0.2
O	C P T CORP	7	4	4.38	+0.1	+2.9
N	COMPAQ COMPUTER CORP	18	8	14.50	-0.3	-1.7
A	COMPUTER CONSOLES INC	12	6	8.25	-0.4	-4.3
O	CONCURRENT COMP CORP	25	1	12.75	-0.5	-3.8
N	CONTROL OATA CORP OEL	27	15	23.38	+2.3	+10.7
O	CONVERGENT TECH	14	6	6.63	+0.5	+8.2
N	CRAY RESH INC	100	44	82.00	-3.8	-4.4
O	OAISY SYS CORP	32	8	10.13	+0.4	+3.8
N	DATA GEN CORP	50	30	34.75	-0.1	-0.4
N	OATAPOINT CORP	9	5	7.38	-0.1	-1.7
N	OIGITAL EQUIP CORP	99	50	99.13	+1.8	+1.8
N	ELECTRONIC ASSOC INC	7	4	4.25	-0.3	-5.6
N	FLOATING POINT SYS INC	46	14	14.88	-0.8	-4.8
N	GOULO INC	38	15	18.38	+0.5	+2.8
N	HARRIS CORP OEL	36	22	30.25	+2.4	+8.5
N	HEWLETT PACKARO CO	48	29	43.00	+0.9	+2.1
N	HONEYWELL INC	87	59	71.50	+5.1	+7.7
N	I8M	162	122	139.25	+5.3	+3.9
O	IPL SYS INC	4	1	2.75	-0.3	-8.3
N	ITT CORP	60	32	53.50	+0.0	+0.0
N	M A COM INC	20	13	15.75	+1.0	+6.8
N	MATSUSHITA ELEC INDL LTO	100	49	89.75	+6.3	+7.5
O	MENTOR GRAPHICS CORP	21	11	14.50	+0.4	+2.7
N	MOHAWK OATA SCI CORP	4	1	2.63	+0.1	+5.0
N	N8I INC	16	9	10.13	+0.1	+1.3
N	NCR CORP	57	31	53.13	-1.1	-2.1
N	PRIME COMPUTER INC	28	15	20.88	+1.0	+5.0
N	SPERRY CORP	76	46	76.00	+0.4 -	+0.5
O	STRATUS COMPUTER	26	15	22.00	+0.8	+3.5
O	SYM8OLICS INC	16	7	7.00	-0.1	-1.8
O	TANOEM COMPUTERS INC	39	13	37.88	-0.5	-1.3
N	TANOY CORP	45	32	35.25	-0.9	-2.4
N	TEXAS INSTRS INC	148	88	117.50	+1.9	+1.6
A	ULTIMATE CORP	35	11	19.13	+1.6	+9.3
A	WANG LABS INC	23	12	13.88	+0.1	+0.9
A	WANG LABS INC	23	11	13.75	+0.3	+1.9
N	XEROX CORP	72	46	57.25	+0.6	+1.1
	SUPPLIES & ACCESSORIES					
N	AMER 8USINESS PROOS	37	25	28.88	-1.1	-3.8
N	8ARRY WRIGHT CORP	25	17	18.63	-0.9	-4.5
A	OUPLEX PROOS INC	23	17	21.50	+1.4	+6.8
N	ENNIS 8USINESS FORMS INC	28	15	24.75	+1.0	+4.2
N	3M CO	115	74	111.50	-0.5	-0.4
N	MOORE LTO	28	18	23.63	-1.0	-4.1
O	STANOARD REGISTER CO	50	30	37.50	+0.3	+0.7
N	WALLACE COMPUTER SVCS	50	33	46.63	+0.4	+0.8

EXCH: N=NEW YORK; A=AMERICAN; P=PACIFIC; 8=BOSTON;
L=NATIONAL; M=MIOWEST; O=OVER-THE-COUNTER; S=SPLIT

O-T-C PRICES ARE 8ID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST OOLLAR

EXCH		52-WEEK RANGE (1)		PRICE CLOSE AUGUST 20 1986	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & DP SERVICES					
O	AOVANCEO COMP TECH	7	3	5.25	+0.1	+2.4
N	AOVANCEO SYS INC	20	11	15.13	+0.1	+0.8
N	AGS COMPUTERS INC	25	14	19.50	+1.4	+7.6
O	AMERICAN MGMT SYS INC	20	8	17.25	+0.0	+0.0
O	AMERICAN SOFTWARE INC	15	9	13.50	+1.1	+9.1
N	ANACOMP INC	7	3	4.13	+0.1	+3.1
O	ANALYSTS INTL CORP	10	4	4.50	-0.1	-2.7
O	ASHTON TATE	34	10	27.13	+0.6	+2.4
O	ASK COMPUTER SYS INC	15	7	11.50	+0.5	+4.5
O	ASTRAOYNE COMP INO	3	1	2.63	+0.7	+37.7
N	AUTOMATIC OATA PROC	39	18	33.50	+0.3	+0.8
O	COMPUTER ASSOC INTL INC	25	10	23.75	-0.5	-2.1
O	COMPUTER HORIZONS CORP	15	10	11.00	-0.1	-1.1
O	COMPUTER NETWORK TECH	10	2	6.81	+0.0	+0.0
N	COMPUTER SCIENCES CORP	40	22	37.75	+1.8	+4.9
O	COMPUTER TASK GROUP INC	19	11	11.75	+0.0	+0.0
O	COMPUTONE SYS INC	6	1	1.75	-0.1	-6.7
O	COMSHARE INC	13	9	12.25	+0.1	+1.0
N	CULLINET SOFTWARE INC	20	8	8.25	-0.5	-5.7
O	CYCARE SYS INC	17	10	12.00	+0.0	+0.0
O	OUQUESNE SYS INC	45	11	29.50	+0.5	+1.7
N	GENERAL ELEC CO	83	56	76.13	-0.8	-1.0
N	GENERAL MTRS CORP	50	33	40.00	-1.3	-3.0
N	GTE CORP	58	38	57.88	+2.3	+4.0
O	HOGAN SYS INC	12	4	10.75	+0.4	+3.6
O	INFORMATION SCIENCES INC	4	1	2.00	-0.1	-5.9
O	INFOTRON SYS CORP	23	12	12.00	-0.5	-4.0
O	KEANE INC	17	7	7.38	-0.1	-1.7
N	LOGICON INC	43	27	28.13	+0.4	+1.4
O	LOTUS DEV CORP	39	15	37.75	+2.8	+7.9
O	MANAGEMENT SCI AMER	16	8	14.75	+0.3	+1.7
O	MCI COMM CORP	13	8	8.00	+0.3	+3.2
O	MICOM SYS INC	23	10	11.25	+0.3	+2.3
O	MICRO PRO INTL CORP	4	2	2.25	-0.2	-7.7
O	MICROSOFT CORP	36	26	30.00	+0.3	+0.8
O	NATIONAL OATA CORP	26	11	18.38	-1.1	-5.8
O	ON LINE SOFTWARE INT	16	6	11.75	-0.5	-4.1
O	ORACLE SYS CORP	29	14	15.25	-0.6	-3.9
N	PANSOPHIC SYS INC	36	18	29.75	+1.6	+5.8
N	PLANNING RESH CORP	24	14	20.50	+0.3	+1.2
O	POLICY MGMT SYS CORP	24	15	17.50	+0.0	+0.0
O	PROGRAMMING & SYS INC	11	5	9.00	+0.0	+0.0
O	REYNOLOS & REYNOLOS CO	41	18	41.00	+4.5	+12.3
O	SCIENTIFIC COMPUTERS INC	6	4	4.25	+0.0	+0.0
O	SEI CORP	28	15	18.25	+2.0	+12.3
O	SHAREO MEO SYS CORP	41	29	35.25	+1.1	+3.3
O	SOFTWARE AG SYSTEMS INC	22	13	16.75	-0.3	-1.5
O	SOFTWARE PU8G CORP	10	5	5.63	+0.1	+2.3
A	STERLING SOFTWARE INC	21	7	17.25	-0.6	-3.5
N	UCCEL CORP	23	13	20.88	+0.9	+4.4
N	URS CORP	18	10	16.25	+0.8	+4.8
O	VM SOFTWARE INC	32	17	28.50	+1.3	+4.6
	SEMICONDUCTORS					
N	ADVANCEO MICRO OEV	34	14	16.63	+0.3	+1.5
N	ANALOG DEVICES INC	25	14	17.63	+0.6	+3.7
O	ANALOGIC CORP	16	10	12.00	+0.5	+4.3
N	APPLIEO MAGNETICS CORP	20	12	15.50	+0.0	+0.0
O	AVANTEK INC	24	16	17.88	+0.5	+2.9
O	HADCO CORP	7	4	4.63	+0.0	+0.0
O	INTEL CORP	32	16	21.25	+1.3	+6.3
O	MICRO MASK INC	8	2	2.63	-0.4	-12.5
N	MOTOROLA INC	50	29	40.38	+1.5	+3.9
N	NATIONAL SEMICONOUCTOR	16	9	9.63	+0.4	+4.1
N	TERAOYNE INC	30	17	20.00	+0.9	+4.6

EXCH		52-WEEK RANGE (1)		PRICE CLOSE AUGUST 20 1986	WEEK NET CHNGE	WEEK PCT CHNGE
	PERIPHERALS & SUBSYSTEMS					
A	AM INTL INC	9	3	6.13	-0.1	-2.0
A	ANDERSON JACO8SON INC	3	2	2.25	+0.0	+0.0
O	AST RESH INC	33	11	13.25	+2.4	+21.8
O	AUTOTROL CORP	10	6	7.00	+0.0	+0.0
O	AVANT GRAOE COMPUTING	9	3	3.50	+0.3	+7.7
O	8ANCTEC INC	13	7	7.00	-0.1	-1.8
N	8OLT BERANEK & NEWMAN	48	28	41.75	-0.1	-0.3
N	CENTRONICS DATA COMP	8	4	7.63	-0.3	-3.2
A	CETEC CORP	9	6	6.38	+0.1	+2.0
A	COGNITRONICS CORP	6	3	3.13	-0.3	-7.4
N	COMPUGRAPHIC CORP	29	16	16.25	-1.0	-5.8
N	COMPUTERVISION CORP	19	9	12.63	-0.1	-1.0
N	CONRAC CORP	18	11	15.63	+0.4	+2.5
A	DATAPRODUCTS CORP	18	11	13.13	-0.5	-3.7
A	DATARAM CORP	18	5	9.25	+0.1	+1.4
O	DATA SWITCH CORP	9	5	6.25	+0.1	+2.0
O	DATUM INC	7	5	5.63	+0.0	+0.0
N	OECISION INDS CORP	15	9	10.00	+1.1	+12.7
O	ENDATA INC	8	3	5.25	-0.5	-8.7
O	EVANS & SUTHERLAND	27	17	22.38	+1.0	+4.7
N	FLOATING POINT SYS INC	46	14	14.88	-0.8	-4.8
O	GANDALF TECHNOLOGIES	8	5	6.13	-0.1	-2.0
N	GENERAL OATACOMM INO	15	8	9.63	-0.6	-6.1
N	HAZELTINE CORP	28	16	19.13	+1.3	+7.0
O	ICOT CORP	13	6	10.00	+1.0	+11.1
O	INFORMATION INTL INC	18	10	15.31	-0.2	-1.2
O	INTECOM INC	7	3	5.06	+0.1	+2.5
O	INTERLEAF INC	15	8	7.75	-0.4	-4.6
O	MEGAOATA CORP	5	3	3.13	+0.3	+8.7
A	MSI OATA CORP	14	8	10.25	-0.1	-1.2
N	NASHUA CORP	28	12	27.63	+0.5	+1.8
O	NETWORK SYS CORP	26	10	12.50	+0.0	+0.0
N	NORTH AMERN PHILIPS CORP	48	32	39.25	-0.5	-1.3
N	NORTHERN TELECOM LTO	38	25	29.38	-0.1	-0.4
O	NOVELL INC	21	10	20.25	+1.4	+7.3
O	OMEX	1	0	0.38	+0.0	+0.0
N	PARADYNE CORP	13	6	6.25	-0.4	-5.7
A	PENRIL CORP	9	5	5.00	+0.1	+2.6
N	PLESSEY PLC	38	19	28.38	-0.6	-2.2
O	PRINTRONIX INC	15	11	13.63	+1.5	+12.4
O	QMS INC	16	6	13.63	-0.9	-6.0
O	RAMTEK CORP	7	2	6.00	+0.0	+0.0
N	RECOGNITION EQUIP INC	17	9	11.50	+0.3	+2.2
N	SANOERS ASSOC INC	63	29	59.88	+0.0	+0.0
O	SCAN TRON CORP	24	12	18.75	+0.3	+1.4
N	SCIENTIFIC ATLANTA INC	15	9	8.88	+0.3	+2.9
O	SEAGATE TECHNOLOGY	14	5	12.88	+0.9	+7.3
N	STORAGE TECHNOLOGY	7	1	2.63	+0.0	+0.0
O	SUN MICROSYSTEM INC	20	11	15.13	+0.6	+4.3
A	T-BAR INC	7	5	6.25	+0.1	+2.0
A	TAB PROOS CO	15	10	14.13	-0.4	-2.6
O	TANDON CORP	8	3	3.75	+0.3	+7.1
A	TEC INC	9	4	4.88	-0.6	-11.4
N	TEKTRONIX INC	65	47	61.00	+2.1	+3.6
O	TELEVIOEO SYS INC	4	2	3.00	+0.5	+20.0
N	TELEX CORP	69	41	58.38	+2.9	+5.2
N	TIMEPLEX INC	24	14	15.13	-0.5	-3.2
N	TITAN CORP	12	5	9.38	-0.3	-2.6
O	VISUAL TECHNOLOGY INC	2	0	0.63	+0.1	+24.8
O	WYSE TECH	19	7	16.63	+1.0	+6.4
	LEASING COMPANIES					
N	COMOISCO INC	25	12	19.13	-0.9	-4.4
N	CONTINENTAL INFO SYS	12	5	10.50	+0.4	+3.7
O	FINALCO GROUP INC	5	3	3.50	+0.4	+12.0
O	PHOENIX AMERN INC	6	2	3.88	+0.1	+3.3
O	SELECTERM INC	12	5	6.00	+0.3	+4.3
N	U.S. LEASING	46	32	42.00	+0.5	+1.2

COMPUTER INDUSTRY

INSIDE

The recent divestiture of ITT's telecommunications business may spur a major restructuring of Europe's telecom industry/**81**

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INSTANT ANALYSIS

''Not since the introduction of the IBM Personal Computer and the jump from eight to 16 bits has this kind of opportunity been available.''

— John Gribi, chief financial officer, Compaq Computer Corp., on the forthcoming generation of Intel Corp. 80386-based microcomputers

Cullinet suffers first loss

But Chapman sees growth in VAX software offerings

By Charles Babcock

WESTWOOD, Mass. — Despite his company's first-ever quarterly loss, announced last week, Cullinet Software, Inc. Vice-Chairman and Chief Executive Officer David L. Chapman claims the firm is developing technologies that will allow it to resume its usual pattern of growth.

Cullinet's Chapman

For the first fiscal quarter ended July 31, Cullinet lost $10.6 million, or 35 cents per share, on revenue that plunged 25% from year-earlier levels to $31.8 million. The results included a write-off of $7 million for the remaining assets of Computer Pictures Corp., acquired by Cullinet in 1982. The after-tax impact of the write-off was 12 cents per share. In the year-earlier quarter, Cullinet earned $4.2 million, or 14 cents per share, on sales of $42.3 million.

Chapman said the company saw no immediate relief from the current market slowdown. But in an interview at the Westwood, Mass., company headquarters, shortly before the results were announced, Chapman ticked off a series of reasons why he thinks the losses will be short-lived.

While sales of Cullinet's flagship IDMS/R data base management system are obviously down, Chapman claimed the product fares well in face-offs with its competition. "We're seeing the first glimmer of increased market demand," he claimed.

In Cullinet's fledgling application business, Chapman acknowledged that competition was keen for financial application packages, but, he said, "Manufacturing software for the DOS marketplace is beginning to pick up."

None of these developments, however, was able to offset the final write-off of Computer Pictures, a $14 million cash acquisition in 1982 of a microcomputer graphics and analytical software firm.

Chapman, nevertheless, said Cullinet was continuing to invest heavily in new technologies and will make

See **CULLINET** page 108

Used computer mart heats up

By Alan Alper

While declining capital expenditures at corporations nationwide are causing many computer manufacturers to sing the financial blues, the computer industry slump is creating sundry opportunities for peddlers of used equipment.

In contrast to firms such as IBM, Honeywell, Inc. and Data General Corp., used computer suppliers say the business environment for their wares is as good as it has ever been. Some vendors stress that tighter budgets at many corporations and educational institutions has purchasing agents turning toward used gear to help stretch limited financial resources.

"Certainly, lower cost is a primary incentive to buy used equipment," notes Michael Wolfe, president of Century Computer Brokers, Inc. of Culver City, Calif., a supplier of used peripherals and data communications products.

Wolfe points out that while a new 900 line/min Dataproducts Corp. printer lists for $10,000, a used one sells for $2,500.

Some companies also purchase used equipment and cannibalize it for spare parts. "If a company needs a logic board repaired in a terminal, it can cost $200," Wolfe explains. "You can get a new terminal for $250, put the logic board in yourself and get other spare parts you might need later."

Many companies are embracing used computer equipment at a time when budgetary retrenching abounds, notes Bob Weissblatt, president of Computer Resale,

See **USED** page 86

INDUSTRY INSIGHT
Bob Djurdjevic

IBM lets its defenses down

Why is IBM opening up?

After decades of almost airtight control of its captive markets, there is a breath of fresh air in IBM's strategies. IBM seems to be opening up to the world in more ways than one.

First, the company's senior executives, led by its new chairman, John Akers, exhibited an unusual air of openness at the June meeting for financial analysts in San Jose, Calif. Second, IBM is also opening up its Systems Network Architecture (SNA) communications strategy.

In an unusual departure from the behavior of his predecessors, Akers stayed on the podium well past his planned time; IBM chairmen have traditionally tried to limit their exposure to the outside world to a minimum. He tackled most of the analysts' questions head-on.

In the end, his openness and courage earned him genuinely enthusiastic applause from the nonpartisan group, which contrasted with the reactions to the usually bland speeches by IBM chairmen in the past.

IBM's new president of the Communications Product Division, Terry Lautenbach, also talked of opening up the gates to the jewel of IBM's communications strategy, SNA, with some 23,000 licenses installed worldwide.

"We have a clear direction in our communications strategy," he asserted. "We think that SNA is the best network

See **IBM** page 85

Djurdjevic is a computer industry analyst and president of Annex Research, a Phoenix-based computer research and consulting firm.

HP announces earnings rise, printer OEM deal with Zenith

By Maura McEnaney

PALO ALTO, Calif. — Hewlett-Packard Co. stayed closed to Wall Street predictions and posted a 6% earnings increase for the third quarter ended July 31.

Separately, HP announced an OEM agreement to sell its Thinkjet portable printer to Zenith Data Systems as part of Zenith's $30 million Internal Revenue Service contract for portable computers.

HP will supply up to 18,000 printers, which will retain the HP label, to be bundled with Zenith's Z-171 portable.

HP's third-quarter earnings increased to $123 million, or 48 cents a share, compared with $117 million, or 45 cents a share, for the third quarter of last year.

HP sales increased 11% to $1.8 billion, compared with $1.6 billion for the same quarter a year ago.

Orders for the quarter increased 25% over a year ago, a gain that surprised several analysts. "I thought they'd do about 18%," said John Geraghty at First Boston Corp. "All of a sudden, their orders are up. That's not bad in an environment where orders have been sluggish."

Incoming orders were $1.8 billion, compared with $1.4 billion in the third quarter of 1985. International

See **HP** page 108

Diversification, Dbase III Plus boost Ashton-Tate quarterly revenue 87%

By Ninamary Maginnis

TORRANCE, Calif. — Ashton-Tate last week reported second-quarter earnings of $6.5 million, an 87% increase over the $3.5 million reported for the like quarter last year.

In part, the boost was due to Ashton-Tate's acquisition of Multimate International Corp. late last year, an expanded product line and continued strong sales of its Dbase III Plus data base management application, according to industry analysts.

The company reported earnings of 53 cents per share, compared with 37 cents per share in the second quarter of fiscal 1986. Second-quarter revenue was $49 million, a 78% increase over revenue of $27.5 million in the year-earlier quarter.

"The dramatic increase in revenue reflects the acquisition of Multimate and some new products they are promoting that weren't there in last year's April and July quarters," said Edward Cotter, an analyst with Philadelphia-based W.H. Newbold's Son & Co. "The quarters we are now comparing didn't have Multimate, Framework II and Dbase III Plus."

Michael Goulde of Boston-based market research firm the Yankee Group agreed. "Ashton-Tate has become more diversified and less dependent on revenue from any one product," he said. "They made some very smart acquisitions."

See **ASHTON-TATE** page 108

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